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NATURE MAGAZINE

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JANUARY 1928 Vol. 11. No 1

CAMERA HUNTING on the CONTINENTAL DIVIDE

by ARTHUR NEWTON PACK

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

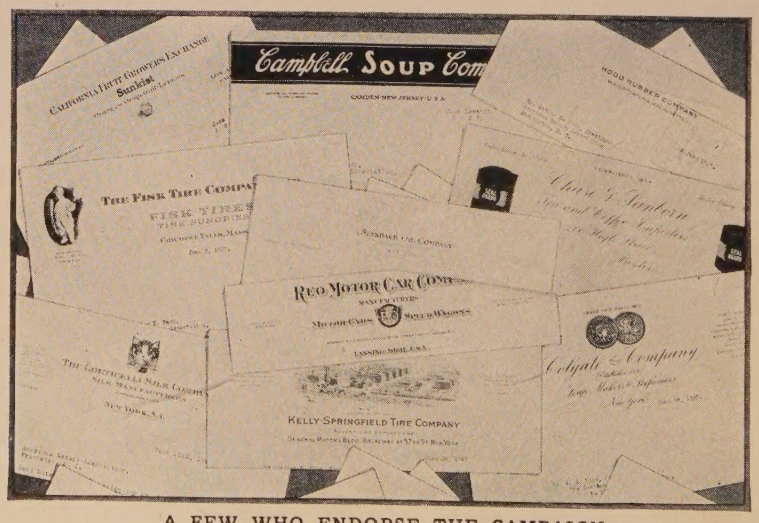
DURING 1928 the American Nature Association will actively carry forward its Outdoor Good Manners Campaign which gained widespread notice and support during 1927. In cooperation with the National Committee for the Restriction of Outdoor Advertising, the Association will continue its educational work to the end that our rural landscapes may be free of billboards.

The Association has recently conducted a poll of sentiment among large national advertisers and has received a remarkably fine response. Some of the leading manufacturers have declared themselves as either opposed to billboard advertising or as in favor of it only under restriction to purely commercial vicinities. The National Committee received a similar response from firms that agree that business can succeed without using the landscape for advertising.

Space does not permit the printing of all of the names of the organizations that have gone on record, but a few that have declared themselves as opposed to the use of rural billboards, or as using them only until prevailing leases expire, are indicative of the trend.

Among the automotive advertisers that may be listed are: Chrysler, Dodge, Locomobile, Nash, Reo, Studebaker and Velie; the Fisk, Gates, Goodrich, Hood, Kelly-Springfield, Mason and Mohawk tire companies; the Champion Spark Plug and Boyceite. The National and F. H. Bennett Biscuit Companies and the Continental and Ward Baking Companies are included, as are Clicquot Ginger Ale, Chase and Sanborn, Kaffee Hag, La Touraine Coffee, Lowney's, Nunnally and Whitman. There is a large group of foodstuff advertisers including Armour, Cream of Wheat, Campbell Soup, Del Monte products, Knox Gelatine, Sun-Maid Raisins, California Fruit Growers Exchange, Log Cabin Products, Welch Grape Juice, and H. H. Heinz Company. The Arrow Collar manufacturers, Kirkman and Son, soap manufacturers, the Standard Oil companies of California, New Jersey and New York, and many others may also be listed.

The list is growing rapidly as public sentiment expresses itself as opposed to the offending billboard that ruins a beautiful view. Such a board is hardly a stimulus to buy the product advertised and the advertisers are beginning to realize this.



A FEW WHO ENDORSE THE CAMPAIGN AGAINST THE UNSIGHTLY BILLBOARD

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.
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Additional Offices of Publication, Greenwich, Conn.
New York Advertising Office, 171 Madison Avenue.
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Speechless...When a Few Words Would Have Made Me!

But now I can face the largest audience without a trace of stage fright

THE annual banquet of our Association—the biggest men in the industry present—and without a word of warning the Chairman called on me to speak—and my mind went blank!

I half rose from my seat, bowed awkwardly and mumbled, "I'm afraid you'll have to excuse me today," and dropped back in my chair.

Speechless—when a few words would have made me! The opportunity I had been waiting for all my life—and I had thrown it away! If I could have made a simple little speech—giving my opinion of trade conditions in a concise, witty, interesting way, I know I would have been made for life!

Always I had been a victim of paralyzing stage fright. Because of my timidity, my diffidence, I was just a nobody, with no knack of impressing others—of putting myself across. No matter how hard I worked it all went for nothing—I could never win the big positions, the important offices, simply because I was tongue-tied in public.

And then like magic I discovered how to overcome my stage fright—and I was amazed to learn that I actually had a natural gift for public speaking. With the aid of a splendid new method I rapidly developed this gift until, in a ridiculously short time, I was able to face giant audiences—without a trace of stage fright!

What This Course Teaches You

How to talk before your club or lodge
How to address board meetings
How to propose and respond to toasts
How to make a political speech
How to tell entertaining stories
How to make after-dinner speeches
How to converse interestingly
How to write letters
How to sell more goods
How to train your memory
How to enlarge your vocabulary
How to overcome stage fright
How to develop self-confidence
How to acquire a winning personality
How to strengthen your will-power and ambition
How to become a clear, accurate thinker
How to develop your power of concentration
How to be the master of any situation

Today I am one of the biggest men in our industry. Scarcely a meeting or banquet is held without me being asked to speak. My real ability, which was hidden so long by stage fright, is now recognized by everyone. I am asked to conferences, luncheons and banquets as a popular after-dinner speaker. This amazing training has made me into a self-confident, aggressive talker—an easy, versatile conversationalist—almost over night.

* * *

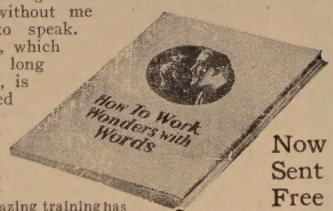
No matter what work you are now doing nor what may be your station in life; no matter how timid and self-conscious you are when called upon to speak, you can quickly bring out your natural ability and become a powerful speaker. Now, through an amazing new training you can quickly shape yourself into an outstanding influential speaker able to dominate one man or five thousand.

In 20 Minutes a Day

This new method is so delightfully simple and easy that you cannot fail to progress rapidly. Right from the start you will find that it is becoming easier and easier to express yourself. Thousands have proved that by spending only 20 minutes a day in the privacy of their own homes they can acquire the ability to speak so easily and quickly that they are amazed at the great improvement in themselves.

Send for this Amazing Booklet

This new method of training is fully described in a very interesting and informative booklet which is now being sent to everyone mailing the coupon below. This booklet is called, *How to Work Wonders With Words.* In it you are told how this new easy method will enable you to conquer stage fright, self-consciousness, timidity, bashfulness and fear. Not only men who have made millions but thousands of others have sent for this booklet and are unstinting in their praise of it. You are told how you can bring out and develop your priceless "hidden knack"—the natural gift within you—which will win for you advancement in position and salary, popularity, social standing, power and real success. You can obtain your copy absolutely free by sending the coupon.



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Please send me FREE and without obligation my copy of your inspiring booklet, *How to Work Wonders With Words,* and full information regarding your Course in Effective Speaking.

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ANNOUNCING

Getting Your Goat

or Camera Hunting on the Continental Divide

"the most thrilling and spectacular motion picture story of camera hunting ever taken in the United States"

WILLIAM L. FINLEY

who made this remarkable picture on the recent Pack-Finley expedition under the auspices of the American Nature Association, has consented to lecture with it personally during the season

January 1—April 15, 1929

All who have seen the Finley pictures in the past will agree that this is the best yet

When you have read the story of the expedition, appearing in Nature Magazine for January, February, March, July, and August, 1928, you will be more than ever eager to see this picture and hear Mr. Finley.

Rocky Mountain Goats — photographed in the wild from within fifty feet
Beaver—actually photographed in the wild while building a dam
Rocky Mountain Bighorn Sheep
Pronghorn Antelope—photographed from a pursuing automobile at 45 miles an hour
Moose, Elk, Mule Deer, Bears, Marmots

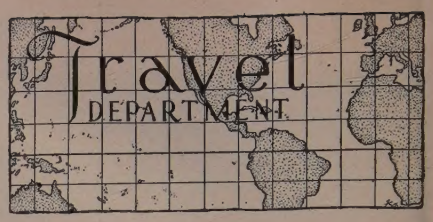
An ideal feature for the winter program of Hunting and Fishing Clubs, City Clubs, Nature Clubs; and absolutely unique as a private entertainment.

SOME of Mr. Finley's engagements include: Boston City Club; American Museum of Natural History; Field Museum of Natural History; Columbia University; Indiana University; Universities of Illinois, Minnesota, California, and Oregon; Camp Fire Clubs of New York and Chicago; City Club of Milwaukee; Westmoreland Club; Worcester Club; Carnegie Institute; Pittsburgh Academy of Science and Art; Detroit Athletic Club; Advertising-Selling League, Omaha, Nebraska; Bruner Bird Club, Lincoln, Nebraska; Philadelphia Academy of Natural Sciences; Women's Clubs of Erie, Pa., Haverhill, Mass; Toledo, Ohio, and St. Louis, Mo.; St. Paul Institute; Women's Literary Union, Portland, Me.; American Game Protective Association; Buffalo Society of Natural Sciences; various Chapters of the Izaak Walton League of America; Public Museum, Milwaukee; various Boy Scout organizations; Edison Club, Chicago; Audubon Societies of Massachusetts, Ohio, and Illinois; National Association of Audubon Societies; Hartford Bird Study Club; Saint Mary's School, Peekskill, New York; University Clubs of Detroit, Buffalo, and Cleveland; Philips Exeter Academy; Bowdoin College; Brook's Club of New Bedford; Toledo Chamber of Commerce; Miss Chapin's School, New York City; The Lawrence School, Long Island, New York.

Dates for the coming season should be arranged as soon as possible by addressing

EXTENSION DEPARTMENT
AMERICAN NATURE ASSOCIATION
15 Boudinot Street, Princeton, New Jersey

A few dates for Mr. Finley's lectures during February, March, and April, 1928, are still available



It is the intention of this special Travel Department of Nature Magazine, which will be printed each month, to give the readers information which will be of service in inspiring them to travel, and in placing before them facts relative to the cost of traveling. They will be told what may be seen in different sections of the United States and Canada and in other countries, and—in brief be given a real travel service.

The editor invites the readers to ask for information. Requests will be quickly and fully answered.

Bermuda will have many thousands of American visitors this winter. The delightful climate, semi-tropical, is a most pleasant release from the cold and biting weather in many of the states during the winter months. There are sailings by different lines at regular intervals, the trip taking two days, and tours are also arranged for a limited period of days at moderate prices. Bermuda has considerable bird life, but little animal life. Lovers of flowers will find delight in the great variety of them. An interesting feature of the Island is that all of the drinking water used is rain water, which is caught in house cisterns, or in large, so-called catches hollowed out of the lime stone formation on the hillsides.

* * *

One of the popular ways of going to Southern resorts during the winter is by water, and The Clyde Line announces putting into commission a new and fast steamer, sailing every Saturday from New York for Miami.

* * *

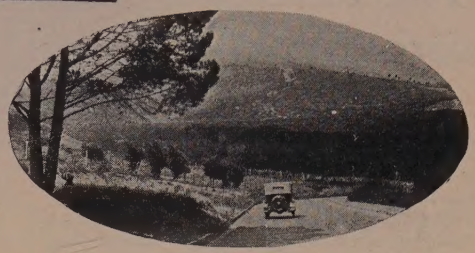
Mid-winter trips to Porto Rico are becoming more popular as that interesting island becomes better known to American tourists. The rates are moderate and the hotel accommodations are excellent. There is much to be seen by motor sight-seers, and there are many other interesting islands not too far away to be taken in on one of the many cruises offered by different steamship lines. Porto Rican wild life is of a tropical luxuriance that fascinates the Nature lover.

* * *

Nature Magazine readers who contemplate ocean voyages during the winter should remember that the winter rates on most of the steamship lines are considerably below the summer

Zimbabwe Ruins

South Africa



Now That Winter Has Come

with its dreariness and freezing winds, the glorious

Land of Sunshine Beckons

You surely must have longed to tread other lands than these of home. Maybe you are weary and surfeited with the humdrum, foot-worn paths of Europe and the Orient. In either case,

SOUTH AFRICA

extends to you a new, fresh, ever-varied and delightful panorama of changing scene and life, not to be found elsewhere.

Here you will experience pleasures and thrills that will cheer your heart and remain ever a delight in your memory. South Africa is a veritable treasure house of fascinating wonders—a Pandora Box from which your hands will draw out, every moment, some new and wonderful happiness,—a continuous round of charms which never pall or cloy.

Here you will see sights you can never see elsewhere under like conditions—civilization and primeval life moving side by side. And, in addition, a veritable flood of general health-giving sunshine warming and lighting each happy hour. *Come to South Africa.*

A NUMBER of luxurious cruises to South Africa have been arranged this winter. They offer you the opportunity of a lifetime. Choose which of the beautifully equipped steamers you prefer. Every care has been taken to assure your comfort and pleasure. Each boat has been specially arranged to insure ease and luxury, from the time you leave New York—Independent trips may be easily arranged, on fast modern vessels if you prefer.

South Africa is a land of invigorating climate, where life is full of song and pleasure. Here modern civilization moves cheek by jowl alongside of picturesque, quaint, dignified native Kraal life—Side by side with modern surgery witch doctors still ply their craft.

You will find striking animal life and luxurious flowering vegetation of unique and interesting character, glorious flowers and luxuriant fruits. The beauties of the Kirstenbosch Botanical Gardens offer a striking contrast to the primeval forests. You can use a ricksha pulled by a warrior Zulu or, if you prefer, an American automobile is at your disposal. You will find modern comfortable hotel accommodations. You travel on swift modern railway trains, or over miles of iron-stone motor roads; while at eventide, if you desire, you enjoy the latest "hits" at the theatres or drink in the glory of the Victoria Falls by moonlight.

There are many things in South Africa you can never see in other countries:

Great Diamond Mines
Mile Deep Gold Fields
Mysterious Zimbabwe Ruins
The Magic Cango Caves
Barbaric Bantu War Dances
Quaint Kaffir Kraals
The Mighty Drakensberg Mountains
Wonderful Victoria Falls
Speedy, Preening Ostriches
Kruger Big Game Park
and Glorious Cape Peninsula

SURF Bathing on unrivalled sea-beaches. Sea angling from rock bound coasts for the finest sporting fish of the world. Trout fishing in Golden Rivers—the angler's paradise. Golf on sporty courses midst nearby towering mountains. Year round outdoor tennis on fast, true, ant-heap courts.

The *de luxe* cruises to South Africa this winter are rapidly being booked. You will find this trip a pleasurable relaxation and enjoy scenes and activities which will always remain a wonderful reminiscence.

Write for detailed information and free booklet, "In the Track of the Sun" or send 12c (to cover postage) for fully illustrated travel literature.

SOUTH AFRICAN TRAVEL BUREAU

Bowling Green Offices

11 Broadway, New York City

The Pajama Patrol comes down to fight!

When Lieutenant Paddy M'Canlon of the early morning "Pajama Patrol" came down in a shell crater full of mud and water, he made one of the funniest landings known to history. Later, Paddy conscripted a pompous general and the two grimly fought back advancing grey hordes. This newest flying corps story of *Laurie Erskine*, "The Man Who Reformed a General," is a headline story that starts the January issue of THE AMERICAN BOY off with a bang.

Directions for Building an Outdoor Duration Model Airplane. One of the articles in this issue gives you easy-to-follow directions for building a plane of the type that makes flight records. Of balsa wood and bamboo, with wings of Japanese imperial tissue, similar planes have flown fully ten minutes. You can fly it in local and national outdoor contests in competition for the Mulvihill Trophy, the national official prize.

Drumbeaters Island, by Kent Curtis. A weird mystery on a lone Bahama island. A haunted castle. Pineapple Jim Turbyfill chained and bound and held prisoner inside of it by the dervish-like Ali and a mob of blacks. Lex Brassgat and Hoppy Clarke to the rescue! Stumbling through dark passages, onto a great snake. Thudding of drums and moaning of the mob outside while Lex and Hoppy unbind Pineapple. A chance for freedom—and then—a blunder brings the mob on them. Plenty of action in this mystery story.

The Keepers of the River Dam, by Paul Annixter. When Tunawa, leader of the otters, commits the offense that to old Keeonek and the other beavers is unpardonable, the two clans crash in battle. The glimpses of otters and beavers at work and play when ice and snow grip the world will fascinate you. A great story.

The second instalment of James Hendryx's "Connie Morgan Hits the Trail" carries you into a clash of dog-teams on the edge of an icy cliff—then among seasoned sourdoughs who can't be licked by odds. In "Barrett of the Air Police," Thomson Burtis, student of aeronautics and an able prophet, spins a yarn of 1980. Coach "Nibs" Price, whose teams have won the Pacific Coast Championship four years in succession, writes a basket-ball article packed with pointers.

Give yourself a year of adventure and sport with THE AMERICAN BOY. Mail the coupon today.

20c a copy at all news-stands. $2.00 a year by mail. Two years for $3.00. Subscribe for two years and save a dollar.

The American Boy

THE SPRAGUE PUBLISHING CO.
No. 210 American Bldg., Detroit, Mich.

Enclosed find , for which send THE AMERICAN BOY for year , beginning with the current issue, to

Name_____

Address_____

Canadian postage, 25c per year extra
Foreign postage, 50c per year extra

rates. Any steamship line will be glad to send information, or information as to cost may be had by writing to the Travel Department of Nature Magazine.

* * *

South Africa is coming rapidly to the fore as a very attractive country to tourists, particularly those who have traveled extensively in other places and who love to travel for travel's sake and for the new scenes which they enjoy. Excellent steamship accommodations are offered, and tours of South Africa from Cairo to the Cape can readily be arranged. The traveler has an opportunity for seeing a large variety of wild life as well as wonderful scenery. Any reader of this magazine who sends his name and address to the Travel Department will be supplied with most attractive literature regarding the South African trip, literature which can't fail to whet his appetite to go to the country which up to recent years has not been open for general tourist travel.

* * *

Travel to the West Coast by steamer by way of the Panama Canal offers a variety of experiences which is attracting a great many who go to the Pacific Coast. The trip from New York by way of the canal is sufficiently long to give the tourist ample opportunity for a delightful rest on first-class steamers. The interesting daylight trip through the Panama Canal is always a big attraction. The weather in winter is delightful, and Southern California and other points along the West Coast lose little opportunity of telling how attractive their weather is both summer and winter. Many take the trip by steamer both ways, and others enjoy the round trip passage one way by steamer and one way by train. First-class accommodations may be had on both steamer and on train. Attractive literature describing the steamships, the Panama Canal Zone, and points along the Pacific Coast may be had by application to this office.

* * *

Hotel men in Florida are anxiously awaiting the opening of the Florida season. Hotels are offering special inducements to guests and in many cases the rates quoted are lower than they

200 All Expense Tours $195 up. Booklet Free.
Mediterranean and Scandinavian Cruises, $390
ALLEN TOURS, Inc., 154 Boylston Street, Boston

She Knows Her Smokes

CRUISING THE CANADIAN

LABRADOR

by

Howard H. Cleaves

"You have heard of the *wild west*" writes Mr. Cleaves. "This is the *wild east*. The country has changed but little since Audubon's voyage in 1833. For more than three months we never slept on land. We encountered Indians, birds, seals, icebergs, fog, gales. There were no automobiles and I almost forgot how to dodge them. We gorged ourselves on native berries, salmon, herring, codfish, trout. Once I ate porpoise. It is tender and tasty."

This new lecture, illustrated by motion pictures and expertly hand-tinted slides, has proved an outstanding feature in the courses of clubs, schools and institutes during the present season.

Other lectures by Mr. Cleaves are:

Wild Life Adventures
Outdoors in the West
Birds of the Atlantic Coast

For illustrated folder write:

AMERICAN NATURE ASSOCIATION
15 Boudinot Street Princeton, N. J.

GROUND SQUIRREL AT NATURE'S DINING TABLE

THE AMERICAN NATURE ASSOCIATION

PRESENTS

GUY C. CALDWELL

Rocky Mountain Guide

In Nature Programs de Luxe

Illustrated by motion pictures, autochrome plates and hand painted slides.

NEW PROGRAMS AVAILABLE

The Call of the Rockies
Trees in their native haunts
Bird Songs and Wild Flowers
Autochrome studies of the Rocky Mountain region

Mr. Caldwell imitates some 200 bird songs and calls by natural whistling. Last season he delivered 135 programs to delighted audiences. "The most beautiful program we have ever had" was the usual comment.

For lecture engagements address

EXTENSION DEPARTMENT
AMERICAN NATURE ASSOCIATION
15 Boudinot St., Princeton, N. J.

Have the best new books come to your home by mail ~ *like a magazine!*

Get only those you want, and pay only for those you keep... Find out how the Book-of-the-Month Club prevents over 50,000 people from missing the new books they want to read.

AGAIN and again you miss outstanding books you want to read. Through oversight, or because you are too busy, you just "never get around to it." Take the Book-of-the-Month service—it does not cost you a cent! *—and this need never happen again!* How is it prevented?

The plan is simplicity itself. The publishers of the country submit their books to the Book-of-the-Month Club in advance of publication. Every month a distinguished group of critics chooses the most readable and most important ones—fiction and non-fiction. They also choose what they consider the "outstanding" book every month. This we call the "book-of-the-month."

But, if you are a subscriber, before you get the book-of-the-month, or any book, *you receive a full report about it.* If you judge, from this report, that you want it, you let it come to you. You receive it by mail, on or shortly after the publication date, *so that you can't miss it.*

If one of the other books reported upon appeals to you more strongly, you specify that that one be sent. And if none of them appeal to you in any month, you take none at all!

Moreover, whenever you take a book on the recommendation of our selecting committee, *you are guaranteed against dissatisfaction.* If you don't like it, you may exchange it for some other book you prefer.

Over 50,000 of the most notable people in this country—in every line of endeavor—now guard themselves, by means of this service, against missing the new books they want to read. Why don't you try it?

The cost of this unique and convenient service is—nothing! There are no fees, no dues, no extra charges of any kind. *You pay only for the books you keep,* and for them you pay the same price as if you got them from the publisher himself by mail!

Is it possible to give book readers a more complete and valuable service? If you are interested, mail the coupon below for complete information as to how this service operates. Your request will involve you in no obligation.

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Please send me, without cost, a booklet outlining how the Book-of-the-Month Club operates. This request involves me in no obligation to subscribe to your service.

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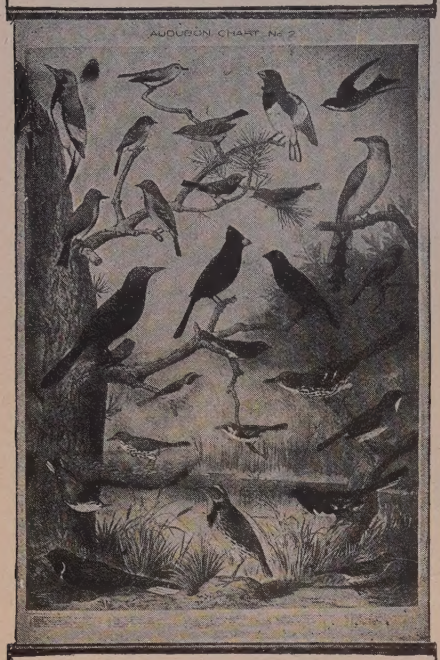
Audubon Bird Charts



Twenty-six Common Birds
(In Color)

Drawn by EDWARD KNOBEL
under the direction of RALPH HOFFMANN

The Birds pictured are as follows:

Red-winged Blackbird	Golden-crowned Kinglet
Bluebird	Robin
Bobolink	Chipping Sparrow
Catbird	Song Sparrow
Cedar Bird	Barn Swallow
Chickadee	Chimney Swift
Purple Finch	Scarlet Tanager
Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
Ruby-throated Humming-Bird	Black and White Warbler
Blue Jay	Yellow Warbler
Kingbird	Downy Woodpecker
Baltimore Oriole	House Wren

Interesting-Instructive

Awaken the interest of children in our common birds with these charts depicting the natural colored, life-sized birds in their characteristic attitudes. They are practical and helpful in all nature study and drawing.

Lithographed and mounted on cloth. Size 27 x 42 inches

For
Home Schoolroom Library

Four Beautiful Charts

Price $2.50 Each

AUDUBON BIRD CHARTS
1214 Sixteenth Street
Washington, D. C.

have been for some years. There is a very evident effort to induce tourist travel to Florida, both by rail, by steamer and by automobile.

* * *

The outcome of the winter travel period will be awaited with unusual interest. Floridians do not overlook the fact that their State exploitation was considerably set back by financial reverses in real estate dealings, but they have faith in the many attractions of their State and of the particular fascination of their climate in winter and believe that the number of visitors from other States, while it may not reach the peak this coming season which was reached in past seasons, will steadily grow.

* * *

The American Express Company has issued some very attractive literature on tours through North America. It is remarkable how far one may travel and the things one may see at a moderate cost by taking advantage of the tourists' trips which are offered by so many travel companies.

* * *

The Santa Fe is already booking dates well in advance for a large number of Eastern and Northern people who are planning to spend a goodly portion of the cold months in Southern California. There is, at the present time, a very steady demand for the Santa Fe literature, which is always attractive and interesting.

* * *

The fact that the beginning of the Sunset Route Rail Journeys to California by way of the Southern Pacific is from New Orleans, attracts a great many Western bound travellers who have not had an opportunity to see much of the South and who like to see New Orleans on their way West. The company reports steadily increasing travel and the expectation of a very good season.

* * *

Thomas Cook & Sons have recently issued a very attractively printed and tastefully bound book on the World Cruise of the Northern and Southern Hemispheres for 1928. This publication is excellently illustrated and the articles describing places of interest along the proposed route are excellently done and highly educational.

TEST YOUR ART *ability* FREE

HERE is your opportunity to find out how much talent you have. Our simple, scientific Questionnaire tests your natural sense of design, proportion, color, perspective, etc. It may show you the way to a bigger future—a real career.

Federal Students Are Successful

Many Federal School students are making $3,500, $4,000 $5,000 and $6,000 yearly. The Federal School is recognized everywhere by employers of artists and by buyers of art work. Big prices are paid for drawings.

Learn Commercial Art at Home

If you like to draw, an almost sure indication of talent, the Federal Course will quickly develop your ability to earn money. Some students earn more than the cost of the course while studying. Many nationally known artists have contributed exclusive, illustrated lessons to the Federal Course. No previous training is needed. You will receive personal, individual criticism on your work.

Send TODAY for Questionnaire!

Just fill out and mail the coupon, stating your age and occupation. There is no cost or obligation to you.

Federal School of Commercial Designing
1908 Federal Schools Bldg., Minneapolis, Minn.

Send me your analysis questionnaire without cost or obligation.

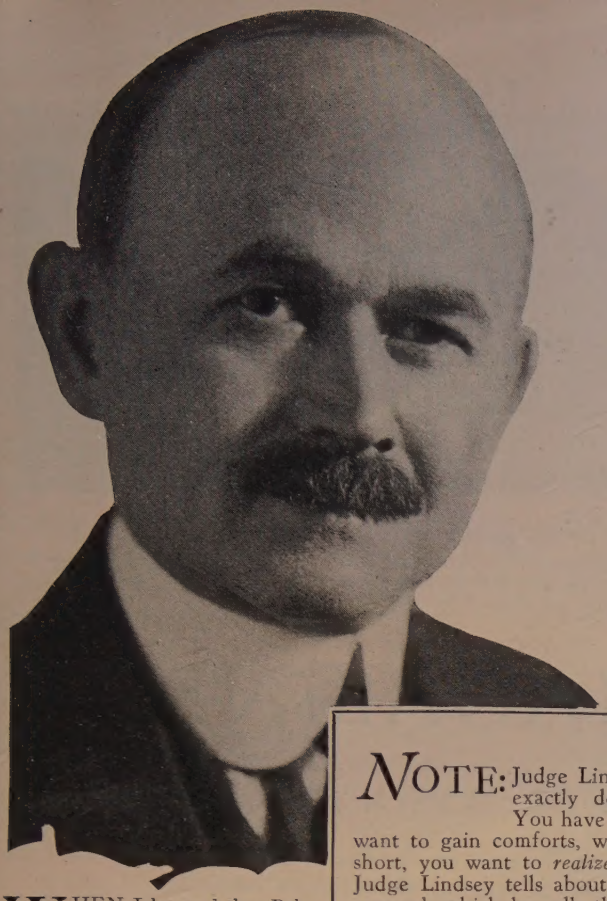
Name.....
Present
Age..... Occupation.....
Write your address plainly in margin

Charles Crawford Gorst
Lecturer
Singer of Bird Songs
Entertainer

Illustrated Lecture ⁊ Entertainments
Bird Music ⁊ Bird Life ⁊ Nature

For terms, eight-page folder and guarantee, write

CHARLES C. GORST
28 Beaufort Road Boston 30, Mass.



The Science of Self Realization

By Judge Ben B. Lindsey

NOTE: Judge Lindsey has coined an apt thought exactly describing what all of us want. You have ambitions. You have hopes. You want to gain comforts, wealth, honor, respect, power. In short, you want to *realize* your inner self. In this article Judge Lindsey tells about the remarkable method he discovered, which he calls the "Science of Self-Realization." This method will help you to discover yourself—tell you how to develop the powers of self-realization that will bring you greatest advantages and benefits.

WHEN I learned that Pelmanism had been brought to America, by Americans for Americans, I was among the first to enroll. My reasons were two: First, because I have always felt that every mind needed regular, systematic and scientific exercise and secondly, because I wanted to find out if Pelmanism was the thing that I could recommend to the hundreds who continually ask my advice in relation to their lives, problems and ambitions.

I first heard of Pelmanism while in England on war work. Sooner or later almost every conversation touched on it, for the movement seemed to have the sweep of a religious conviction. Men and women of every class and circumstance were acclaiming it as a new departure in mental training that gave promise of ending that *preventable* inefficiency which acts as a brake on human progress.

Pelmanism is a big, vital, significant contribution to the mental life of America. I have the deep conviction that it is going to strike at the very roots of individual failure, for I see in it a new power, a *great* driving force.

Failure is a sad word in any language, but it is peculiarly tragic here in America, where institutions and resources join to put success within the reach of every individual. In the twenty years that I have sat on the bench of the Juvenile Court of Denver, almost every variety of human failure has passed before me in melancholy procession. By *failure,* I do not mean the merely criminal mistakes of the individual but the faults of training that keep a life from full development and complete expression.

It is to these needs and these lacks that Pelmanism comes as an answer. The "twelve little gray books" are a remarkable achievement. Not only do they contain the discoveries that science knows about the mind and its workings, but the treatment is so simple that the truths may be grasped by anyone of average education.

As a matter of fact, Pelmanism ought to be the beginning of education instead of a remedy for its faults. First of all, it teaches the science of self-realization; it makes the student *discover* himself; it acquaints him with his sleeping powers and shows him how to develop them. The method is *exercise,* not of the haphazard sort, but a steady, increasing kind that brings each hidden power to full strength without strain or break.

Its big value, however, is the instructional note. Each lesson is accompanied by a work-sheet that is really a progress sheet. The student goes forward under a teacher in the sense that he is followed through from first to last, helped, guided and encouraged at every turn by conscientious experts.

In plain words, what Pelmanism has done is to take Psychology out of the college and put it into harness for the day's work. It lifts great, helpful truths out of the back water and plants them in the living stream.

Other methods and systems that I have examined, while realizing the value of mental exercise, have made the mistake of limiting their efforts to the development of some single sense. What Pelmanism does is to consider the mind as a whole and treat it as a whole. It goes in for mental team play, training the mind as a unity.

The human mind is *not* an automatic device. It will *not* "take care of itself." Will power, originality, decision, resourcefulness, imagination, initiative, courage—these things are not gifts, but results. Every one of these qualities can be developed by effort just as muscles can be developed by exercise. I do not mean by this that the individual can add to the brains that God gave him, but he can learn to make use of the brains that he has instead of letting them fall into flabbiness through disuse.

Pelmanism is no miracle. It calls for application. But I know nothing that pays larger returns on an investment of one's spare time from day to day.

(Signed) BEN B. LINDSEY.

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As Judge Lindsey has pointed out, Pelmanism is neither an experiment nor a theory. For almost a quarter of a century it has been showing men and women how to lead happy, successful, well-rounded lives. 650,000 Pelmanists in every country on the globe are the guarantee of what Pelman training can do for *you.*

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AMERICAN NATURE ASSOCIATION EXPEDITION

The experiences and discoveries of the exploration party headed by President Arthur Newton Pack will be described in a series of articles in Nature Magazine, the first on Page 9 of this issue

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NATURE CALENDAR

JANUARY

by E. Laurence Palmer

JANUARY got its name from the god, Janus, who had two faces and looked in two directions. This need not be taken to mean that he, the god, was "two-faced" in the modern sense of the expression. The unique type of the god's head made it possible perhaps to see more than one side of an argument. Certainly among Nature lovers we have a variety of individuals who might be classed with Janus under either category. There are those who gush about kindness to dumb animals from the protecting folds of fur coats and we are compelled to wish that they might be like Janus and see the story back of the fur coat.

A wounded great horned owl such as may be found in many parts of the United States in January was brought into my office the week that I am writing this. The hunter had been reading economic ornithologists to such an extent that he could not see in the owl anything but a destroyer of game. He could not see that other Nature lovers were deprived of the thrill of seeing this great bird of prey by his act in shooting the bird. There is an aesthetic as well as an economic side to ornithology. A bird so uncommon that one ordinarily sees but one or two a year is entitled to some consideration aside from its economic value particularly when that is not necessarily established. Why not organize a Janus Nature Club in which the members pledge themselves to see at least something of merit in everything ordinarily maligned in Nature? Some most interesting and profitable debates might arise from the activities of the members of such a club.

Since January is probably the coldest month in the year it is not surprising to find our woods and fields populated with many species normally to be found only to the north. Snowy owls may join the great horned owls in destroying rabbits that might otherwise ruin our orchard trees. The great horned owls may begin nesting in January.

The weasels which, in brown coats, raid our chicken coops in summer may now be raiding mouse burrows in coats of white. In this latter activity, they are distinctly helpful to agriculture.

Meadow mouse dens may be frequently detected with ease in January by the midden heaps or outside toilets which they establish. It is highly possible that the practice of being sanitary in this way is a strong factor in the ability of meadow mice to prosper in the face of a world full of enemies. Certainly Nature is full of many species that foul their own nests.

It is interesting that the god Janus possessed something the like of which apparently does not appear in Nature. This is particularly so when one appreciates how valuable it might be to have faces looking in all directions. Nature makes some provision in this connection as you may discover for yourselves in January.

In the southern part of the country January may bring forth great numbers of slugs which instead of having two faces may have their eyes placed on stalks so that they may see in all directions. This is so in spite of the fact that they probably react to the sense of smell more strongly than they do to the sense of sight.

Crayfish such as may be found mating in January equal Janus by having their eyes on stalks which are so placed that vision is possible in all directions from which danger might come.

Rabbits crouched in a form or in the snow do not need two faces since their eyes are placed on the sides of their heads in such a manner that they can see in practically all directions.

Watch the nuthatch at your feeding station equal Janus' ability by nervously looking in all directions in the middle of what must be a most satisfying meal. Alertness to danger is naturally most highly developed in those forms of Nature which profit by "advance information" and escape.

It is probably just as well that Nature has not duplicated the two faces of the god in Nature itself. While it might be profitable for a creature to have two sets of eyes and there are those that do have two sets, and while it might be profitable for a creature to have two noses, it would hardly be profitable for a creature to have two mouths, and possibly a double appetite to keep those mouths busy. Food is not abundant to most species of life in January and one mouth and one appetite are sufficient. The god may not have had to eat but all living things must if they would continue to live.

Truly January is "on the fence" looking both ways. The bare branches of birch and alder defy the threat of winter and at the same time toss the seeds of another generation to the winds. While starvation seems to threaten them as at no other time of year, the crows begin building nests for hungry young to come. January is justly named after Janus.

THE BIGHORN, OR ROCKY MOUNTAIN SHEEP

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January, 1928

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A RARE "SHOT"

CAMERA HUNTING *on the* CONTINENTAL DIVIDE

by Arthur Newton Pack

Photographs by William L. Finley and the Author

A machine is made, a horse is born;
No four-wheel brakes, no screaming horn—
But hoofs take trails that wheels don't know
With saddle cinch and latigo.—x6

This is the first story of the Pack-Finley camera hunting expedition of the American Nature Association in Glacier Park and across the Canadian border, along the Continental Divide.

"WELL, SIR," said Jim, as he led his new parcel of dudes to the hitching rack and glanced over them with appraising eye, "there's just one thing that these horses are afraid of and you got to look out for." He paused to let the remark sink in and then continued. "They're all plumb scared to death that somebody might holler out 'Whoa!' and that they wouldn't hear it."

One by one, Jim hefted the four movie cameras and three still cameras, stowing them away with assorted artist's supplies in the wide box panniers on "Honest John, the quietest pack horse in the world", braced his foot against John's ample middle regions, and pulled tight the diamond hitch. Then, picking up the lead rope, he swung into his own saddle, and we followed—zig-zagging our way over a shoulder of the mountain to our first night's camp on the south fork of Kennedy Creek. The expedition was officially under way.

No rock garden made by man could equal the flowery meadows which became brighter and more vivid as we ascended to the timber line. Yellow ragwort and arnica dotted the blue mantle of lupines and harebells with starry profusion. Indian paintbrushes of varied reds and pinks added still another note of color, while the exquisite mariposa lily nodded in its grassy setting. Over the summit of the ridge we came into a belt of burned country where the hoarse cry of the Clark's nutcracker was the only sound that broke the stillness. We were seven small specks in a great wilderness, each with an idea of telling its story—Bill Finley with his movie machines, Bruce Horsfall with his paints, Mrs. Horsfall with collecting

A PICTURE OF VAST BEAUTY
The horses splashed through many fords, some very deep

paraphernalia, Mrs. Pack and I with still cameras and more movies, Betty Ridsdale with her typewriter as official stenographer for the outfit, and Jim Whilt—ex-lion-hunter, trapper, poet, and guide extraordinary.

Soon fourteen other specks on the trail behind us materialized into grunting pack horses, loaded with tents and blankets, and accompanied by distant cowboy halloas and cries of "Hike, you —— —— cayuse!" Into camp they jingled, and presently the quiet meadow was a-buzz with shouts and the grass heaped high with pack saddles and duffle. "Hi! Head him off, catch him, Slim!" Then pandemonium as a horse bucked furiously free, spattering the landscape with spuds and assorted blanket rolls. Something hit me behind the ear and I turned to pick up my fishing rod—none the worse for the collision. The boys followed a well marked trail of potatoes and caught that "—— Panther horse"—for he alone of the pack string had thus earned a name—four miles down the valley.

A thousand nameless trail horses in the park bear the brand of — X 6. Under saddle they bear themselves in wearied, careful complacence, but once free of halter they respect only the mounted "jingler" who rides out at dawn and just before dark to herd them in or bunch them for the night. And so it was that around the campfire Betty, with due regard to the bony protuberances of her steed, announced that his name was "Napoleon Bonypart." Appreciative grins from the big-hatted and bechapped contingent across the blaze followed, and persisted for so long that Betty made certain mental researches into history and thereafter referred to her animal as "Josephine".

As time went on during the trip, our boys proved themselves expert "jinglers"—for this name rather than "wrangler" is the term applied in the mountains, where the horses are hunted by the sound of the bells hung around their necks. They had a way of "swapping" horses with other guides, during the time we were in the more frequented portion of the park, and as proof of expertness at the horse-trading game, our string began to improve. Panther disappeared, and one day when I was photographing, my lazy old plug—Stonewall Jackson—walked by me on the trail, bearing somebody's mother-in-law. Next morning when the horses were saddled, Lyle, with a twinkle in his eye, remarked that he could not find old "number two" and I would have to ride "this black one". "This

A MOUTHFUL OF GRASS
The golden-mantled ground squirrels preferred it to man's bread

DAWN MIST FALLS—BELLY RIVER
Bruce Horsfall stops to get a sketch for his paintings

EXPLORED A GREAT ICE CAVERN
From its mouth one looked over beautiful blue Elizabeth Lake

black one" had been traded out from between the knees of a short-trip guide with a nervous party; and, as the horse had been "topped" for the season by a cowboy, she thereafter led our procession by virtue of the fastest walk. I alternately endeared her as "Midnight" or cursed her as "Night-mare" for the remainder of the trip.

There is no question about daybreak in camp. Generally speaking the boys would wait patiently until almost six A. M. and then we would hear the day break with a vengeance. "Roll out," yells Vic our cook and the order is generally seconded by assorted yips and near-yodels. A few moments later comes the welcome cry of "Come and get it or I'll throw it away", and breakfast is in order. By 8:30 our duffle is packed, the tepees down and Jim yelling, "boots and saddles".

Over Red Gap Pass lies the marvelous panorama of the Belly River country, and here far above us on the edge of an almost perpendicular cliff we sighted our first goat. The Billy calmly lay down on a ledge where, as Jim expressed it, "there would be only room for one of my feet", and we were obliged to leave him there unphotographed, perched safely on his ledge.

"THE BLACK ONE"
Had been "topped" for the season by a cowboy, hence the antics

Meanwhile our pack train passed us—a long line of grunting horses and shouting packers. In wicked looking zigzags and long switchbacks the trail dropped about a thousand feet to enter the timber, finally swinging northwest to the outlet of Elizabeth Lake, where we forded and then made camp. On either hand the flower-strewn meadows tilted upwards to the mountains, and the horses had good pasturage. One may readily believe that horses enjoy these summer trips as much as people, especially when the moves are not too long and there are many animals together. Horses show a keener sense of companionship than many animals and yet possess individualities, much as do human beings. Ten or a dozen will stay together in a pasture, while two or three others wander off alone like boys exploring.

From our camp on Elizabeth Lake we looked straight up a deep valley which resembled nothing so much as a vast scoop shovel, the upper part ending in a ragged rampart crowned with frowning forts of rock and snow. One could almost imagine those ramparts mounted with great guns. In some past age the earth writhed and heaved these great mountains as the wind throws up waves at sea. Here the heave and lift had been such that the western slopes folded over to-

PACKING ALONG A MOUNTAIN TRAIL
Fourteen pack horses carried the tents and other camp supplies

ward the east. Later came the great ice age, when glaciers—thousands of feet deep—carved out great amphitheaters or cirques. The whole region is so vast that even a panorama camera can record but a single slice at a time; and the tourist, returning, often wonders why his pictures can give but the barest suggestion of what he has seen. One really must see for himself to appreciate.

THREE MOUNTAIN SHEEP ON MARCH

They blend with the background so that early pictures taken were not highly satisfactory

Next day we explored up towards the head of Elizabeth Lake, stopping at a great ice cavern twenty feet wide and perhaps ten feet high. A patch of snow stretched down from the mountain side, so protected from the rays of the sun that it had not melted for many years; and a stream, formed from the more rapidly melting snows above, had worn out the cave so that it made a grotto facing the lake. The lake itself was deep blue in color and around its edges there were no round pebbles, but little flat pieces of red and green shale, worn smooth by the continuous action of the waves. Leaving Elizabeth Lake behind us, we followed a trail through the spruce forest, passing patches of alder which grew more in the form of bushes than trees, because of the high altitude. Our horses splashed back and forth through fords so deep that we could appreciate the origin of the river's name and realize the feelings of a hiker when he termed it the "abominable abdominal river".

Always on the lookout for big game, goats, sheep, deer or elk, we got only occasional glimpses of old Billies too wild to permit our approach, and once we stalked a band of elk to the summit of Indian Pass, only to have them vanish like mist into the canyon beyond. That portion of Glacier Park east of the Con-

A MARMOT UNWITTINGLY POSES

Remarkable picture obtained by Mr. Pack just before he dashed from photographing marmots to chasing Bighorns

tinental Divide ends abruptly near the foot of the mountains adjoining the Blackfeet Indian Reserve. The winter range for game lies chiefly outside the park, and Indian and white hunters annually revive the fear of man. The western section of the park, however, includes a strip of lower country and offers a winter refuge for the animals as well, and there we found all kinds of game more plentiful and easier to approach.

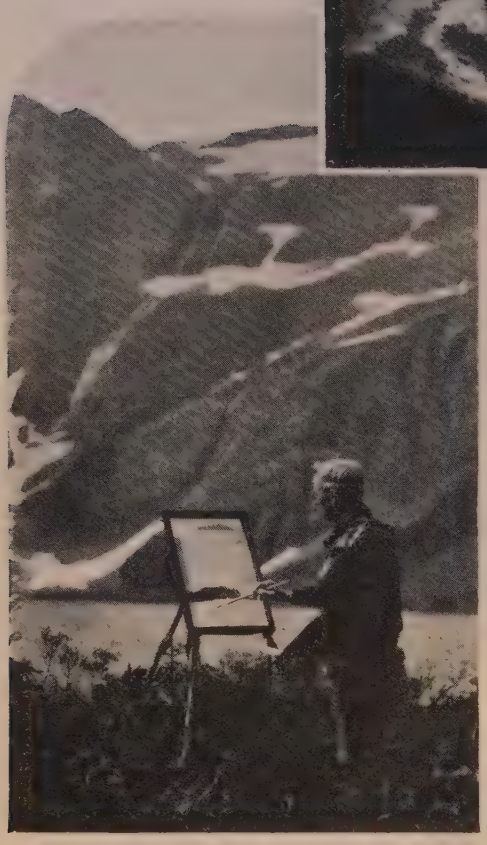
Nevertheless, the small mammals were everywhere in evidence. As we sat down to rest upon a great boulder after giving up the elk chase, little golden-mantled ground squirrels banded in black and brown and white, scurried about us. One in particular seemed tamer than the others as he pulled up tiny sprays of grass by the roots and held them in his mouth. Occasionally he reached up with his two tiny hands and brushed the grass back as if to get it out of his eyes. He came toward us, and we realized that he must have a home nearby—either under the dwarfed fir trees or in the ground. At the distance of two feet from where I sat, he disappeared down a little round hole which we had not seen before because the entrance was so well concealed by the grass. In a few minutes he went up the hillside again, returning with another mouthful of grass. I slipped a little stick down the hole and sat within three feet; he came up with his store of food and couldn't quite understand the door of his home being closed. He dropped his food, sat up, looked at me a minute, and pulling the stick out, darted down the hole, failing to take his supply of provisions. The little fellow worked by the simplest rule of collecting food and making a store somewhere in the earth below. The little stick had interrupted him, and when he returned to the surface after finding everything all right below, he forgot all about the mouthful of grass that lay a few inches from the entrance and scurried off for a new supply. At places where these little squirrels hang about the hotels they are keen for nuts and bits of bread. This little fellow, however, did not know what bread was until I tossed some nearby. He sniffed at it and went on for grass. He is sometimes known as the mountain chipmunk because he is striped along the sides as the chipmunk is; but he is larger in size. Living here at the top of Indian Pass, his hibernating season must have been seven or eight months, for it is not long after the snows of winter disappear before the storms of autumn begin.

INDIAN PASS (Right)
Here the party sighted both elk and Bighorn Rocky Mountain goats

Always amid the rock piles above timber line, marmots whistled now and again in a strange minor key. Once when we were hunting sheep along the great ridge of the Continental Divide, we saw one so large that I took him for a young grizzly bear—we had seen the tracks of a big grizzly that very morning. One day Bill with the movie and I with the still camera had made considerable progress in accustoming a

FOUND: FIVE BIGHORNS
They were feeding peacefuly, then suddenly bolted—straight at the party

A TUNNEL OF ICE
Cavern hollowed by a stream born of melting snows



(Left)
MR. HORSFALL PAINTS
Staff artist gets backgrounds such as appears in the frontispiece of this issue

(Right)
SQUIRREL WELCOME
These little ground squirrels, fed by members of the party, made themselves right at home

marmot family to our presence, while Mrs. Pack stood watch with the other movie. As she stood there quietly a pack rat suddenly appeared, as if minded to steal some of the extra photographic paraphernalia. Photographer and rat were equally surprised, but the rat retreated before the lens could be brought to bear. In the midst of this quiet stalking party a wild cowboy yip resounded, and Lyle galloped up with the cry of "Sheep, sheep, a whole herd of them. Never saw so many together", and several such encouraging statements, from which, knowing the nature of cowboys, we were led to believe that there really might be a bighorn or two somewhere near the trail.

Much to the astonishment of the marmot, the photographers abruptly turned and fled, swung aboard their horses and followed Lyle. Around one half cirque and then another we hurried, and suddenly, in a grassy meadow, sighted five bighorn rams peacefully grazing. Bill picked up one of his movie cameras, ran it for perhaps ten seconds and the film gave out. He seized the other, and exactly the same thing happened; so down he went behind some rocks with his loading bag and began to change film. Two of us circled below the trail to get on a level with the sheep and crept close enough for still pictures. Much to our surprise, the sheep eyed us curiously from time to time without evident signs of fear, but the largest of the five kept sniffing suspiciously and nervously eyeing the queer shape that was Bill Finley. Apparently the animals were more or less accustomed to seeing human beings, creatures which walked upright and, within the boundaries of the park, did them no harm, but here was something down on all fours like a coyote. As Bill drew his arms from the loading bag and glanced in their direction the lead ram tossed his head, the other four stopped grazing and fell in behind him, and all five started up the mountain side. Jim swung

THE LUXURY OF A ROLL
Glad to get those cameras and artists' canvases off his back, and shows it, too

aboard his horse, intending to head them off, and Lyle, whose horse was not within easy reach, rushed from the other direction on foot waving his two-gallon white hat. The lead ram broke into a run, the others following straight in Lyle's direction, and the cowboy, deciding that these were the biggest horns he had ever seen in his life, did what any one else would have done under the same circumstances—he made a perfect baseball slide to safety beneath the shelter of a convenient boulder.

JIM

More formally,—James W. Whilt, ex-lion-hunter, trapper, poet and guide extraordinary

This particular band of sheep had been feeding lower than usual, within easy camera range of the trail, but as they blended too effectively with the rocky meadow background, we were convinced that the pictures would not be altogether satisfactory. Thus, next morning, we set off on foot for the highest ridge of the Divide, climbing slowly under the weight of camera-loaded packs. At length, reaching the first saddle, we skirted a tremendous abutment of rock and looked down over the ice field of Grinnell Glacier. At the lower end lay a huge rocky moraine piled up by the push of the ice and reminding us of the story of a tourist who, after listening to the guide's story of how a moraine was formed, inquired, "But what happened to the glacier?" "Aw", replied the guide, "It's gone back up the mountain to get another load of rocks".

From this point we sighted a trio of Bighorns silhouetted against a background that would thrill the heart of an artist, but even as Bill and Jim started in their direction they turned to trot away. The two mere humans faced an apparently fruitless chase, for their quarry had a big start, and four hooves apiece, besides, designed especially for non-skid travel on the edge of space. Hunters and hunted alike vanished from our sight, but much to our surprise an hour or so later Bill and Jim returned, dog-tired but triumphant; they had stalked the sheep and surprised them lying down on a narrow ledge. It had been a terrific climb, because, in order to keep out of sight of the Bighorns, they had passed above a snow slide, following the narrow crack where the snow had melted away from the almost perpendicular wall of rock, and then climbed up a kind of chimney, boosting and hauling each other by main strength. "Well, sir," Jim orated, "Bill crawled up behind me on that rock and peered over at them sheep lying there and not suspecting anyone was near, he got so excited, I tell you, his eyes bulged out until you could of lassoed 'em with a hay rope. Then Bill raised up that machine of his and it begun to purr, and right then I knew he had 'em. They was a big ram, a younger one and a ewe, and they was so startled they didn't have sense enough to run. Instead they just looked at him and then got up and trotted across the sky-line making the most beautiful picture I bet Bill ever got in his life."

Bill, as usual after success, remained non-committal. The deed was done and he had what he wanted. Mopping his brow he sat down and extracted a precious orange from his pocket; but whether he really was excited or merely shaky from his long climb, he missed his grip on the juicy fruit and it bounded down the mountain side. Down, down, down it went to disappear in the distance. Bill watched it gloomily and then pulled out a dry sandwich, but Jim was still flushed with success and at the top of his form. "Well, sir," he remarked, "as I've always said, that's the reason we don't grow oranges in the Rockies. They just naturally won't stay put."

THE PARTY ATOP THE CONTINENTAL DIVIDE

The panoramas that unfold are so vast and so beautiful that they defy description. One must see to appreciate

M. E. HEWITT

IT CARRIES THE OUTDOORS INDOORS

Lattice properly used can add much charm to a room and often give it appearance of greater size

With the AID *of* LATTICE

by Estelle H. Ries

DURING the earlier days of domestic tranquility in this country, our fathers felt the intimate charm of well-selected vines in blending the house with its settings, and adding color to the low white dwellings that stood back from elm-shaded roads. In their simple gardens, a trellis to support these vines might frequently be found. While lattice had been well known before this time, nowhere had it been used with the refreshing directness of our Colonial craftsmanship.

But since those times, lattice has quietly grown more ornamental in character and intricate in design. Not only does it better serve its original purpose, but many new uses for it have been devised. It has become affixed to the house as part of its decoration, and has also become an interesting element in its interior adornment.

In France, since the days of the Pompadour and more or less ever since, *treillage* has been found not only in gardens but in homes themselves. Especially in sun-porches, breakfast rooms, or wherever it is desired to retain a garden-like or outdoor effect within the house, the indoor use of lattice commends itself. One of its unique uses results from its adaptability for perspective effects. By placing the strips cleverly, a flat panel may be made to look like a recess, and thus add to the apparent size of the room. Lattice is often used to emphasize the architectural divisions of a room or a façade, by means of contrasting color and body. In these instances it is constructed in panels or arches over doorways and window openings or other structural features, and so does much to disguise the monotony of a long stretch of blank wall either indoors or out.

Lattice serves a useful purpose on an open porch by providing semi-privacy for the occupants without interfering with their view beyond. Many a porch has doubled its charm and convenience by this expedient.

Placed around a window, lattice may be used to

LATTICE FOR VINES AND BEAUTIFICATION

It can be made attractively to set off architectural detail as well as serve to hold the growing things

improve a defect in proportion, as well as to support vines if desired, and it is also well fixed in front of a window sill, fence-like, to prevent plant pots from toppling over. I know of at least one case where lattice was placed on the left wing of a house to balance a glassed-in porch on the right wing. The small panes of glass were excellently supplemented by the pattern of the lattice.

On the grounds, too, we find it combining pleasingly with structures of stucco, brick, frame and other customary building materials, as much for its own decorative quality as for the support of vines which are nowadays optional and no longer the only reason for lattice work. Of course this distinction must be made: Lattice which is decorative for its own sake must be more pretentious than if it is to be vine-clad. Patterns of utilitarian lattice are limited by custom to a monotonous repetition of squares, rectangles or diamonds, all of exactly the same size. This narrow range of design is wrongly applied to lattice intended to be ornamental. When beauty is sought in architectural lattices, it may be achieved by introducing a diversity of motifs or by the setting in of separate ornamental panels. It is also possible to secure lattice treatments that reflect various architectural styles, as, for instance, the Adam urn on posts for a Georgian house, a *fleur de lys* design for a French house and other particularly appropriate designs.

One of the most important of all its exterior functions is that of shutting out from the street view or living quarters the inevitable unsightly places about the premises. The alternative adornment of the background and service portion is essential to any harmonious garden scheme. Lattice fences, pergolas and gateways are admirable here, serving perfectly their purpose and adding their unique decorative quality. There is something very intimate and appealing about a lattice fence that adds considerably to the homelike aspect. It lacks the austerity of a masonry wall which, to our American minds, carries the suggestion of unfriendliness. Although covered with almost impenetrable vines, still the lattice fence has inviting lightness and airiness.

There is a psychological as well as practical aspect to the screening of a garden with lattice if it is judiciously done. By partially concealing some portions of it from immediate view, imagination is aroused in picturing the step beyond that is coquettishly tempting the interest of the spectator. And of course a measure of privacy and quiet seclusion may be made possible. As one gardener tenderly puts it, even the flowers and shrubs enjoy the retreat, for they luxuriate in the shelter and their sweet fragrance is not dispersed by rude winds.

The lattice fence also forms a simple background for flowers or shrubs, a much better arrangement than one which finds them located apropos of nothing whatsoever.

M. E. HEWITT

LATTICE USED IN PERGOLA

It can be made to add attractive touches to garden edifices

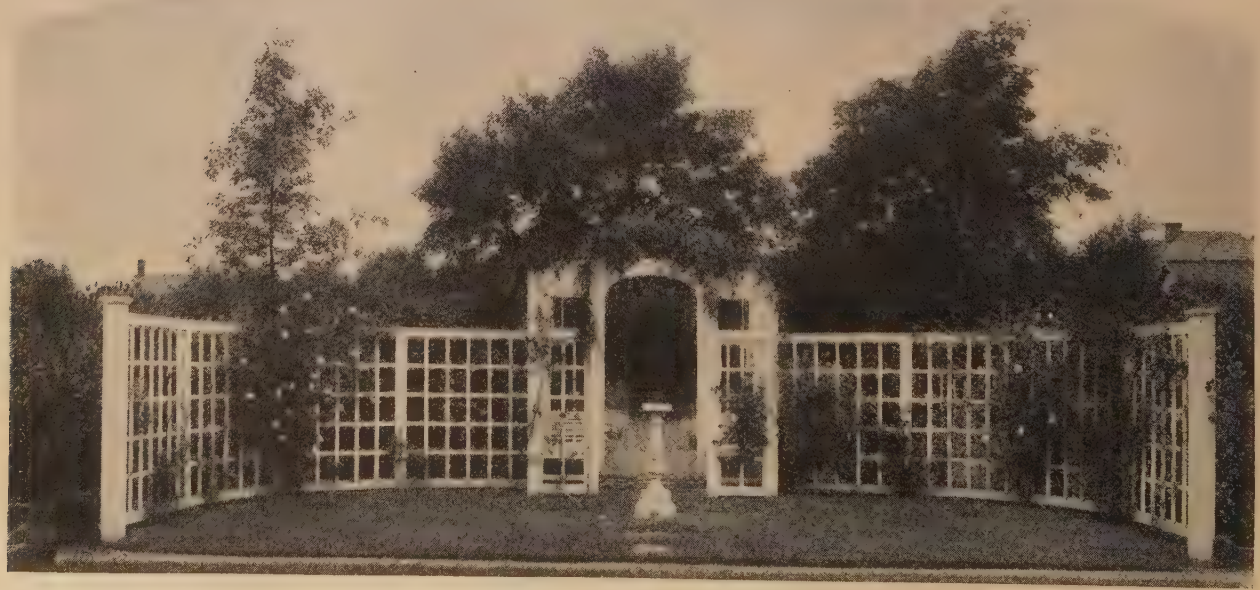
If it is not desired to have the fence entirely of lattice, distinction may be had by adding a finish of lattice at the top. The depth of this should be in pleasing proportion to the height of the fence. Usually two feet or less is agreeable, and the diamond pattern rather than a right-angled one has a more decorative effect.

You can also unite the house with the garage, either by an actual lattice fence, or better yet, a pergola, or more simply for a decorative instead of a practical result, by repeating a decorative latticework motive that both structures will have in common. The lattice motive proves an excellent device for a large estate, taking its place in turn over a garage, an arbor, a pergola, a bath house, the outlying farm buildings, and even in the posts for tennis enclosures, making each one identified with the entire group instead of seeming isolated.

In planning latticework, different combinations of spacing, size and arrangements of the three elements, the posts, rails and strips, will produce many agreeable results. A common fault is that of excessive lightness or heaviness in relation to one another. The use of thin lattice strips with very large posts, or vice versa, should be avoided.

If lattice is to withstand the deteriorating influences of the weather and carry the heavy weights of a rapidly growing vine, it must not only be ornamental, but staunch and strong as well. Due to the lightness of its construction and its constant exposure to the elements, lattice is probably more perishable and shortlived than any other part of building construction. Cypress, white pine and other soft woods are recommended as the proper materials. These woods hold their shape better, do not warp to the same extent that harder woods do, and will not crack at the time of erection. Especially if it is proposed to introduce scroll work or fine pattern where close cutting is necessary, soft wood should be selected, as the points and projections left are less likely to break or chip.

Owing to the excessive dampness which necessarily exists for a great part of the time, the lattice should be put together with wire nails. The best selection is copper screws, though for cheaper work, copper nails or copper



M. E. HEWITT

AN EFFECTIVE USE OF LATTICEWORK

It is attractive as a garden entrance, giving promise of something interesting to be seen behind it

wire may be used to serve the purpose quite well.

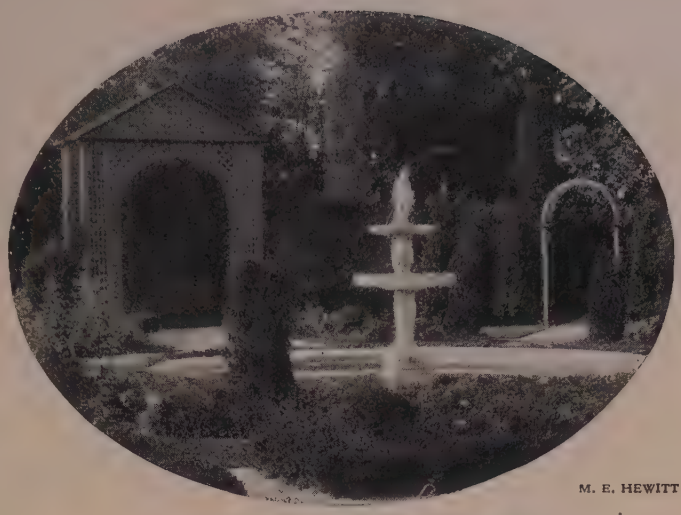
In all cases where lattice is placed against the building, it should be made free-standing and from four to six inches away to afford free circulation of air so that it may become dry at the back almost as quickly as its exposed surface will. This is absolutely essential, for otherwise not only will the lattice soon rot and fall apart and the vine be thrown to the ground, but the safety of the structure will be impaired.

When putting lattice together, special attention must be given to such parts as will in any way serve to retain water. The slightest amount of standing water in crevices or on projections will cause decay very quickly, especially where strips cross one another, for between the two surfaces of the wood, small pockets will form. To avoid this it is possible to notch the strips at these points and later paint them to fill up any crevices.

The painting should be done very thoroughly, all cracks and openings being cared for as well as the surface. Three coats of paint are customary, one before the strips are assembled, one after they are assembled, with special emphasis on the joints, and a final coat when the work has been completed. Some of the waterproof paints commend themselves for this purpose.

The color selected for lattice is largely a matter of securing accord with the surroundings. If it is to serve as a background for vines, green is customary as it approaches the shade of the foliage. Where lattice is used for gateways, interior porches or exterior trim, the general color of the buildings or its surroundings will of course be the deciding factor. Thus a dark brown lattice on certain types of buildings gives a good effect of an Elizabethan half-timber house, while on others, gray might carry out some other scheme. Any strong, decided color is out of place, and a certain neutrality should be maintained. White is extremely effective and charming, sufficiently neutral to harmonize with almost anything, but distinctive too. It must, however, be kept white and not permitted to look shabby or worn lest it lose its decorative value. When it is used structurally it should have the same substantial character that the house has, and should receive similar care in repair.

To those lucky folk with gardens, whether they be simple or elaborate, lattice in one form or another is almost indispensable, for it admirably combines utility and beauty with full deference to both of these qualities.



M. E. HEWITT

A VALUABLE HELP IN THE GARDEN

Lattice makes an attractive summer house in the garden fastness

M. E. HEWITT

AN EXAMPLE OF A MORE ELABORATE LATTICE

It can effectively be used to cut off the inevitable and less sightly parts of the estate

THIS is the second article based on the experiences of the Smithsonian-Chrysler Expedition to Tanganyika, Africa, in search of new tenants for the National Zoological Park in Washington. Next month Mr. Haweis tells a fascinating and human story of the Tall Twiga, known as giraffe.

SARAH

THE YELLOW BABOONS

by Stephen Haweis

Illustrated by the Author

THERE is an old Kaffir song which begins with the query, "Does anybody here know the big Baboon?" And the chorus clamors, "We all know the big Baboon!" as of course everybody who lives in Africa does, for there are baboons nearly everywhere. While all monkeys can climb, of course, the baboon dwells chiefly among the hills and upon the rocky heights. The Chacma baboon of South Africa, which lives in large herds, is a terrific animal which may and does attack man. Any large baboon is a terrifying, if not a dangerous enemy with his huge canine teeth and appalling strength. A big dog baboon of the lesser kinds may well inspire respect when he follows an unarmed pedestrian at close range. If the baboon did attack he could do considerable damage with his strength, speed and truly formidable jaws. A man would be almost helpless in such a predicament, but fortunately the baboons, clever as they are in some ways, do not know that. They seldom show fight, but, like many people who are clever and so seldom have to fight, they are quite apt to shout magniloquent abuse from afar and tell what they would do under other circumstances which they think, and hope, are very unlikely to occur.

The scientist can define a baboon so exactly that no layman can recognise it. I myself could copy out an inch or so from Elliot's great *Review of the Primates,* but meanwhile the layman may be told that the average baboon is a short-tailed monk with a dog-like face, and would appear to have worn out the seat of its pants through sitting on the hot, hard rocks. Baboons live in communities of hundreds and sometimes thousands together and they are expert at raiding the shambas where the maize or millet grows. In Tanganyika they are often rounded up, driven into nets which have been set around their sleeping places and killed mercilessly, ruthlessly, as vermin.

REPOSE

It's a hard life they live among the inhospitable rocks and generations of it have given them a somewhat pinched and worried look. They have to stick together for they have many enemies and mutual help is often far more profitable for them than any self-help could possibly be, Dr. Smiles notwithstanding. When a leopard wanders forth in the evening there is nothing he likes better than a well-fed baboon for his supper. The watchmen keep a sharp lookout for any of the big cats, at suppertime especially. Do they climb so high that the cats cannot easily follow them? Then the eagle is very willing to take advantage of their choice; even the lesser hawks will swoop down upon the babies if they leave the mamma's close embrace for long. For baby baboons cling to their mothers, clasping them round with their strong little arms and holding the hair of mother's back in all four fists. And mother climbs and runs, eats and plays and jumps while the precious burden wakes or sleeps in spite of noise, bumping and the greater perils and accidents which may occur at any moment by cat, snake or rapacious bird.

The storybooks of my youth related that the way a traveller caught baboons was by taking off and putting on a pair of old boots several times in some place where he could be seen doing so by the prey. Leaving the boots displayed conspicuously he would pretend to go to sleep and presently the baboons, filled with curiosity, would come near and imitate him, lacing the

boots on to their feet in such a way that they could not run, when it was easy to catch them. Those skilled artists have passed away: baboons are no longer to be caught in that manner. Perhaps those early hunters had more histrionic ability in demonstration, or their boots were more seductive than those of the present generation, or again, perhaps they merely had an impediment in their veracity. Nets are now the method; the old ones are massacred, but the young ones, when wanted, can then be obtained without their baboots on and soon become friendly and delightful pets. Another means of obtaining the young is by shooting the mother. The baby clings trustfully and will not leave the mother's body until it is cold. But let the hunter shoot to kill if he has a tender heart, for it is not pleasant to hear the wounded's cries of anguish while the other monkeys scream in sympathy and try to hurry their injured comrade out of harm's way to some safe retreat. A mother monkey which saw the hunter and understood that it was he who had killed her baby has been known to dabble her fingers in its blood and to come towards him without fear, holding out her little paws saying, as clearly as need be, "See what you have done!" Very few hunters really enjoy that.

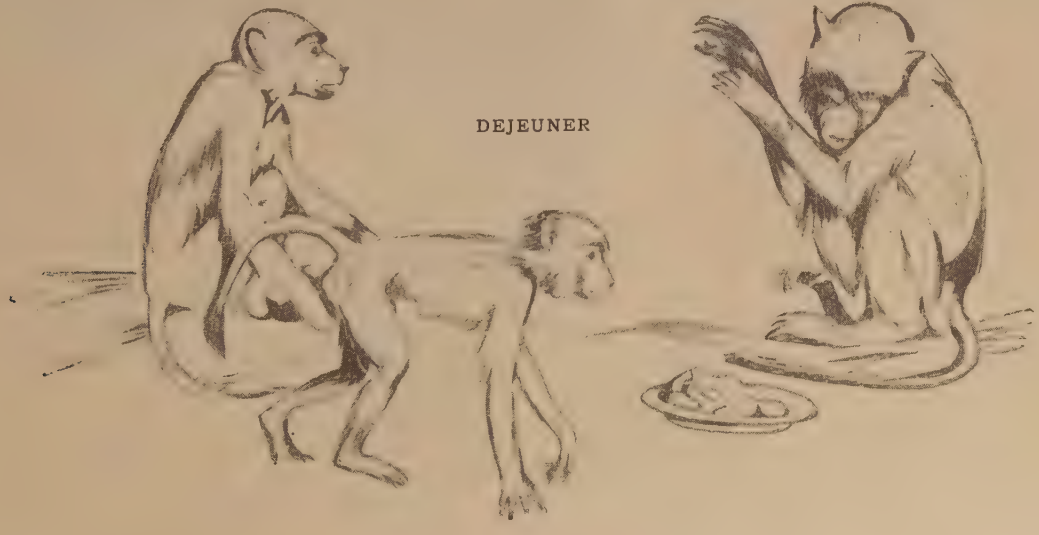
INVESTIGATION

The first baboon we obtained was a half-grown female, an amiable creature which, with a rag belt, jumped about at the end of a string contentedly enough. For a long time we suspected it of being the last baboon in Africa, since no more could be obtained in Dodoma. Presently we found another, a small male which lived in an Indian carpenter's yard and which had become so fierce from the ceaseless teasing it got there that very few people could approach it at all without fear of a serviceable bite. Moreover it screamed incessantly. Still, as it would be company for the first and we could hardly pick and choose from among numbers, we decided to take it. It was of the same species as the first. We introduced the pair therefore: after all we had not come to Africa for a quiet life but to obtain wild animals alive. The result was better than we anticipated and the pair were already living a peaceful brother and sister life before we heard of Sarah. Sarah made a difference.

Sarah is one of those people who would make a difference in whatever society she found herself. Her mother was shot on one of the neighbouring kopjes and when she was picked up was found to have been cut on the wrist by the bullet which passed through her mother's heart. Sarah squalled. At that time it was the only thing she could do and it is characteristic of her that she did it well. She became the property of Nimrod's wife who bound her hand with antiseptic gauze and otherwise saw to Sarah's creature comforts. And Sarah was grateful, so grateful that she became an intolerable nuisance and was offered to us in consequence.

"I'm afraid you won't like Sarah very much," said her owner, "because she screams as soon as I am out of her sight. She won't go to anybody but me, so I have to do everything for her. I feel mean to be getting rid of her, because I am her only friend, but one of us has to go, and my husband thinks it had better be Sarah. She's a dreadful nuisance!"

She certainly was. The whole night long Sarah's screams and reproaches rent the purple veil of heaven and kept every creature awake within a three-quarter-of-a-mile radius from her cage. In the morning at least one of us was almost willing to hit Sarah on the back of her little, half bald neck with a stout stick,—but he didn't do it. Instead, he took her to interview the others of her race which were chained to the bars outside two of the windows of the house. They were separated to that extent because their strings became hopelessly tangled in from three to five minutes when they were near enough to play together. We gave the little creature, still wearing the baby fur she was born in,



DEJEUNER

first to the male monkey whom we called Barum Singh, after the Carpenter. We hoped that he would quiet her and nobody cared very much how he did it, so long as he succeeded. Barum was delighted to be the first choice. He felt he had scored one over Emma and there was an amusing quarter of an hour for everybody concerned.

"See here," said Barum, "don't make that kelele kid, there's no reason to shriek the sky down. Come over here!"

"Baw-aw, . . I want my mummy," replied Sarah concisely.

"Shucks, kidaloo, I haven't got her. Close down the top at least,—you sniff healthy, and pretty good to me. Let me pick dudus off your neck, . . . my, what soft fur you've got!"

"Baw, where's my mummy, I want her," screamed Sarah.

And Emma watched the play with jealousy and growing irritation.

"Sit still, or I'll slap you baby," said Barum, "d'you know, I like turning over your fur. Once in a while I find a teeny, weeny, little flake of skin . . . there's one now, hold still. . . . "

"Let that child alone, Barum, what do you know about babies?" said sister from the next window, sharply.

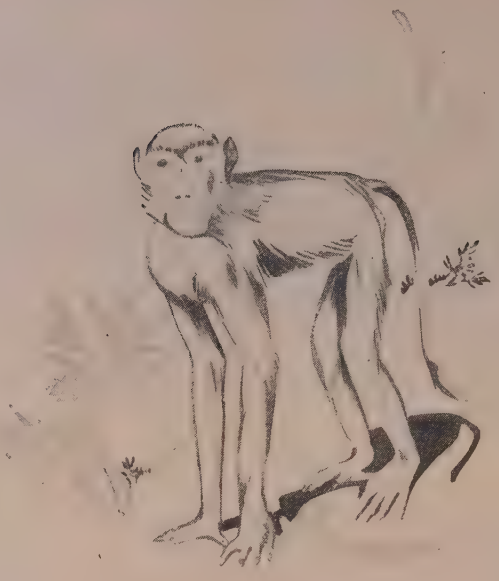
"You rock your tail to sleep, Sister. You've got yours and I've got mine—and we're doing fine. The food-man gave me charge of the kid because I am better able to protect it, and have better judgment and more patience—hold still there, you little wildcat, and leggo my eyebrow. . . ."

"They are getting on pretty well," said the food-man to his friend who was overlooking the bird-cages, "do you think it would be safe to give her to Emma?"

"She might be jealous. I don't know, you might try. But stand ready to give first aid in case of need. I think you could get the mtoto away before she killed it."

"Barum likes her. I'm going to try her out on Sister Emma."

"Baw . . aw . . " screamed Sarah, becoming suddenly tired of Barum's ministrations. So we led her along to Sister Emma's window where she was exhibiting every sign of dumb impatience and solicitation, even if we had not perfectly understood what she was saying.



EXPLORATION

"Give me that child . . the poor mite . . . don't drag her about like that. She don't want a belt and string at all at her age. You've got no more sense about babies than an empty peanut shell. Give her here . . . Ah, no wonder she screams, poor lamb, there dear, come to Mummy's arms. The silly old food-man means well enough, but he is no use for anything but to bring breakfast. There, there, don't you cry any more!"

And Sarah gave one muffled squeal of relief and and rushed into the outspread arms. Nestling beneath Emma's chin she wrapped her little arms round her foster mother and clung where a proper baby baboon ought to cling and in two twos was being petted to sleep by the most completely developed mother instinct that ever a girl-baboon was gifted with.

"That can't last, of course," said the wiseacres, "she may take to her for a while and be quite indifferent to her in a few hours when the novelty has worn off. Monkeys are like that. We shall have to watch carefully to see that the little one gets something to eat. Foster-mother love doesn't often include victuals."

But it did. Sarah was not out of those protecting arms for more than a minute at a time for months after that. Nobody was allowed to touch her, and it was not until they were all put in one cage together that Sarah was allowed to speak to strangers without being pulled away from possibly dangerous contamination. Today she is the fattest of fat babies for, since the first moment Emma has always seen to it that Sarah should have the first pick and the best of everything. Barum was never allowed to eat until both Emma and Sarah had had all they wanted. Sarah, having been petted since before she can remember is quite fearless: she is always willing to talk to anybody who will listen, but still the protective paw of Sister Emma is close at hand to draw her away. Sarah is, in fact, the best chaperoned baboon in America. Her people are most particular whom she knows.

"STRONGER Than Death," a remarkable wild life story by Dallas Lore Sharp, will be one of the features of the February issue of Nature Magazine. The editors feel that this is one of the finest of this gifted writer's stories.

In "Getting Your Goat", Arthur Newton Pack takes his readers along craggy cliffs and perilous precipices a'shooting mountain goats with a motion picture camera. It is a delightful article,—the second in the series resulting from the American Nature Association's Expedition,—and the illustrations can only be described as spectacular.

Other features of the next issue include Stephen Haweis' story of the giraffe; Estelle Ries' article on planning your garden in harmony with your home; W. L. McAtee's story of the naming of our common birds (it will answer many unasked questions); another article in the photographic series. And this is by no means all.

WHEN THE WEATHER MAN GOES ALOFT

Making an eye-reading of the anemometer at the top of a lofty instrument tower above a city skyscraper

Measuring Weather

by
Charles Fitzhugh Talman
of the United States Weather Bureau

WHEN you can measure what you are speaking about and express it in numbers, you know something about it, and when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind. It may be the beginning of knowledge, but you have scarcely in your thought advanced to the stage of a science—LORD KELVIN.

IT IS difficult to realize that men of ancient times, though they were doubtless just as much interested in weather as we are today, had hardly any means of measuring it. Showers of rain fell and people perceived that some were heavier than others, but no instruments or scales for comparing them were in general use in the ancient world. The wind blew—a mere breath or a boisterous gale—and nobody could gauge its strength. Humanity suffered in sweltering heat and biting cold, yet the conception of temperature, as a thing to be measured and expressed numerically—as one could express, even in antiquity, the length of a spear, the breadth of a shield, or the weight of a suit of armor—had not dawned in anybody's mind.

Because we now measure weather in nearly all its manifestations we are able to think more clearly about it than our long-ago ancestors did, and our knowledge of it has become a science. We must not, however, be too proud of this. Many of our weather-measuring processes, and especially the units and scales they involve, are notoriously unsatisfactory. Some of them are so illogical or so unwieldy that they actually hamper the progress of weather science!

Before undertaking to tell how weather is measured one should state what meaning he proposes to attach to the word "weather." Here a difficulty arises. Man's conception of weather was formed and crystallized at a period when no instrumental means of investigating the atmosphere were available and when, therefore, many of its activities were still unknown. Thus it happens that the warmth of the air, the state of the sky, the winds and certain other things that are obvious to the human senses are universally classified as weather, while the weight or pressure of the air, of which nothing was known before the invention of the barometer, is not usually so classified. The conventional idea about barometric pressure is that, while its fluctuations are intimately connected with weather changes, it is not itself an element of weather. Other distinctions of the same kind are commonly made. Everybody considers the electrical display of a thunderstorm an episode of weather, but even the scientific specialist who measures the normal electrification of the atmosphere from day to day hardly thinks of this invisible phenomenon as weather.

U. S. FOREST SERVICE

READING THE THERMOMETERS

The wooden screen keeps out sunshine but permits free circulation of air

In the light of present-day knowledge such distinctions are entirely arbitrary, and we shall ignore them in what follows. We intend to review some of the ways in which meteorology, the science of the atmosphere, applies its measuring-stick to atmospheric phenomena.

The first mercurial barometer

U. S. SIGNAL CORPS

LAUNCHING A PILOT-BALLOON

Note theodolite for sighting the balloon and head telephone for reporting its positions

was constructed chiefly for the purpose of demonstrating the fact that air has weight. Later this instrument acquired a great reputation as a means of predicting weather and was nicknamed the "weather-glass." Though its prophetic powers are not now rated so high as formerly, it remains the most important of meteorological instruments. The column of mercury in the barometer rises and falls with changes of atmospheric pressure, and its length is measured, by means of an attachment called a "vernier," with a much greater refinement of accuracy than is that of the column of mercury or alcohol in a thermometer.

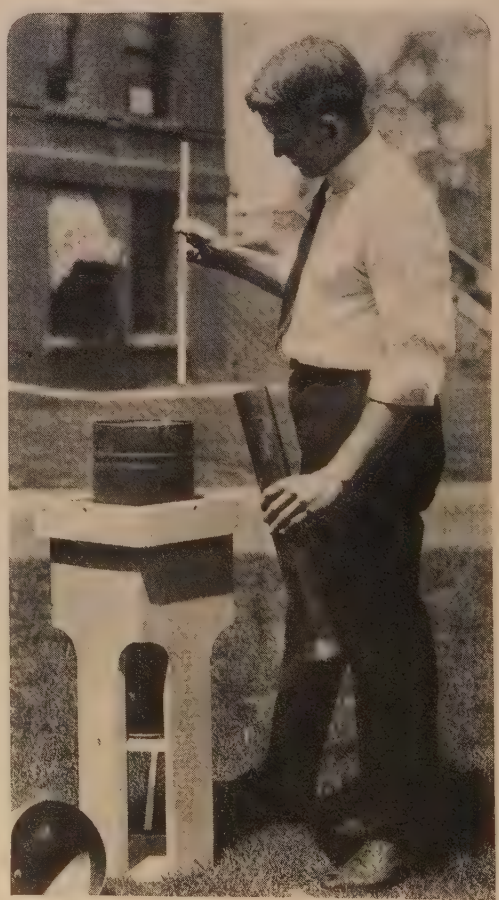
There are some curious things about these measurements. In the first place it is odd that, having measured the length of the mercurial column, the meteorologist should say that the pressure of the atmosphere, which is a force, is so many inches or so many millimeters. This seems as foolish as measuring time in gallons or the length of a room in bushels. In some barometers of recent construction the inconsistency of measuring pressure in units of length is avoided. The scale is graduated in units called "millibars," which represent pressure directly. A millibar is a pressure of 1,000 dynes per square centimeter.

Another strange fact about barometer readings is that they are made almost entirely for purposes of comparison. The reading of a barometer—unlike that of a thermometer or a rain-gauge—is not of much interest in itself, but it is interesting as showing whether the pressure of the air has recently increased or decreased at the place of observation, and how much; and it is especially interesting when compared with the readings of many other barometers, in other localities, so as to show how the pressure varies from place to place over an extensive area. Comparative readings of barometers are the foundation of the telegraphic weather map, from which all scientific weather forecasts are made.

Aneroid barometers, which contain no mercury, are less accurate than mercurial barometers, but more portable and easier to read. The "aneroid," as it is called for short, contains a metal box, exhausted of air, the thin walls of which move in and out with changes of atmospheric pressure. In the common form of the instrument these movements cause an index to move around a circular dial. The aneroid can also be arranged to write its own record, thus becoming a "barograph." The record is generally traced by a pen on a sheet of paper wound around a cylinder, which is turned by clockwork. The paper is ruled to show intervals of time and of pressure.

At a typical large weather station in the United States you will see a pair of mercurial barometers, hung in a glass case, a barograph of the kind just described, and perhaps an ordinary aneroid barometer. If you should travel all over the world, visiting places where meteorological observations are taken, you would discover a great variety of other instruments, differing slightly or widely from these, and all used to measure atmospheric pressure. Nothing about the measurement of weather is more remarkable than the large number of different instruments that have been devised for measuring each of the meteorological elements, such as atmospheric pressure, temperature, rainfall, wind and so on. The barometer family is an especially big one.

There are, for example, mercurial barometers designed to remain vertical and give accurate readings on a ship that is pitching and rolling. There are barometers of the "siphon" variety, with the tube shaped like a capital J, and "diagonal" barometers, in which the upper part of the tube is nearly horizontal, so as to magnify the movements of the mercury and facilitate reading. There are barometers in which glycerine, linseed oil or some other liquid replaces mercury. There



U. S. WEATHER BUREAU

MEASURING THE RAINFALL

Depth of rain is magnified ten times by the tube in the observer's left hand

are so-called "microbarographs," for recording minute and rapid fluctuations of pressure not shown by ordinary barographs. Because the pressure of the atmosphere diminishes upward in a systematic way, a barometer can, with certain adjustments, be used to measure altitude. When designed for this purpose its scale may be graduated to show the altitude directly, in feet or meters, and the instrument is then often called an "altimeter." There are also instruments (of several patterns) called "statoscopes," which show small changes of pressure, due to change of altitude, and are especially useful to aeronauts.

No meteorological measurements are more widely misunderstood by the world at large than those made with the common thermometer. The instrument itself, with its column of mercury (or alcohol for cold climates) and its scale of degrees, is familiar to everybody, but there are two things connected with its use in meteorology that puzzle the layman. First, the meteorologist nearly always makes his thermometer readings in the shade of a wooden screen or ventilated box, even when, on a summer day, people are anxious to know how hot the weather is out in the sunshine. The explanation is simple. The sheltered thermometer gives the temperature of the *air*, which is substantially the same in sun and shade. A thermometer exposed to sunshine, unless strongly ventilated, by whirling or otherwise, shows nothing but the temperature acquired by the instrument itself, which gets much hotter under the sun's rays than the air does. At night an unsheltered thermometer, on account of its rapid loss of heat by radiation, generally reads somewhat lower than the true temperature of the air.

U. S. FOREST SERVICE

HOW HUMID IS THE AIR?

Whirling the sling psychrometer, with its wet and dry bulbs, is one way to find out

WATCHING THE CLOUDS DRIFT BY

The observer is measuring the cloud's movement with a reflecting nephoscope

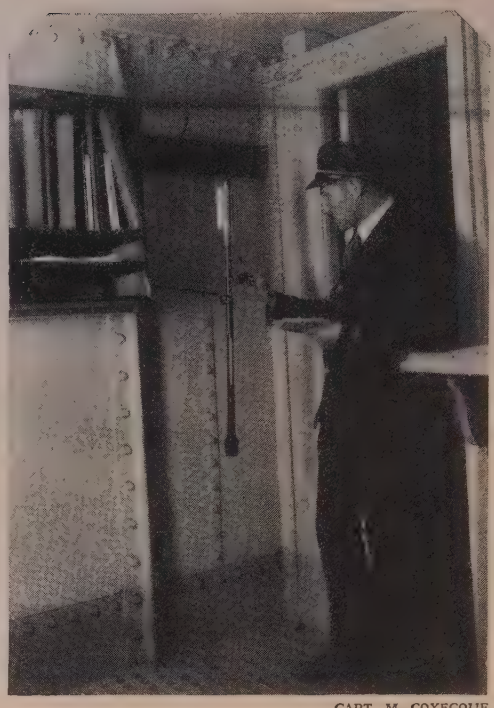
Then, again, many people fail to understand why the indications of the thermometer often differ widely from personal estimates of temperature. The reason is that our sensations of heat and cold, so far as they are controlled by the atmosphere, depend upon more things than the temperature of the air around us. The humidity of the air is an important factor and so is the amount of air movement. Different combinations of these three things give us the same temperature sensation. In order to represent their combined effects on human comfort a scale of "effective temperatures," based on laboratory experiments, has been devised by the American Society of Heating and Ventilating Engineers. In sunny weather a further factor in determining the temperature experienced by humanity is the direct heating of our bodies by the sun's rays. When people talk of the warmth or coldness of the "weather" they nearly always have in mind something quite different from the mere temperature of the air.

Meteorological thermometers are about as varied as barometers. Several have been devised for showing the highest or the lowest temperature occurring between successive settings of the instruments. Then there are many types of "thermograph," for making a continuous record of temperature. There are thermometers and thermographs for measuring the temperature of the soil. There are thermometers that contain no fluid but work on the principle that changes in temperature alter the electrical resistance of a wire, or produce different degrees of expansion and contraction in two kinds of metal. There are "telethermometers" and "telethermographs," which, as these names imply, measure or record the temperature at a distance from the place of observation. This list might be greatly extended.

Meteorologists apply a variety of measurements to the radiant energy that comes to us from the sun and that, in one of its aspects, we call sunshine. The length of time the sun shines each day is shown by the "sunshine-recorder," of which there are several styles. The name "actinometer" is applied to a large family of in-

struments for measuring the intensity of solar radiation, and some of these are known as "pyrheliometers." Some actinometers measure particular kinds of solar radiation, such as the invisible ultra-violet that causes sunburn and has a number of other biological effects.

Water in its different forms, as a gas, a liquid and a solid, plays a mighty part in weather. The amount of invisible water vapor in the atmosphere determines the humidity, and this is measured by numerous instruments called "hygrometers," among which is the "psychrometer," with its "wet bulb" and "dry bulb," seen at most weather stations. The visible forms of atmospheric moisture include clouds, fog, rain, snow, hail, dew, hoarfrost, etc. Most of these things are subjected to measurements of one kind or another. The movements of clouds are measured with a "nephoscope." The depth of rainfall is measured with "rain-gauges" of many patterns, several of which write their own records. There are numerous devices for measuring and weighing snow. There are even dew-gauges and hail-gauges, though they are rarely used. Evaporation is measured by several types of "atmometer."



CAPT. M. COYECQUE

READING THE "GLASS" ABOARD SHIP

The marine barometer is swung from gimbals and always stands vertically

An accurate observation of wind direction is a true measurement. The result is sometimes expressed in degrees of a circle instead of in compass points. "Anemometers" measure either the speed of the wind or the pressure it exerts on objects in its path. Some are specially designed to record the innumerable little gusts and lulls of which most winds are composed. The winds at various levels above the ground up to heights of many miles are sometimes measured by noting the drift of clouds and sometimes by sending aloft small "pilot-balloons," the movements of which are observed with a kind of telescope designed for measuring angles.

Such are a few of the ways in which meteorologists measure weather. There are a great many more. It would take a big book to describe all of them and the bewildering array of apparatus with which the measurements are made and conclusions reached.

A Nature Puzzle

By Florence H. Moore

THE object of this puzzle is undoubtedly Chief Captain of Industry in the animal world, combining the art of designing, architecture and construction to a remarkable degree. In fact, several known instances of his craft have been such models of intelligent conception and workmanship, that if it were not known who the real artisan was, one would conclude that it was the work of human hands. His cleverness and tireless industry might serve as an object lesson to some of his human friends, but the little chap is usually so busy minding his own business, that he hasn't time to wonder what his neighbors are doing.

You will also find the letters of his name in the picture. Write them down as you find them, then assemble in order. Where letters repeat, only one is given. The letter "E" repeats.

In Zoology, he is an *amphibian rodent,* and has palmated hind feet. The dictionary will enable you to find out what this means and you will then feel better acquainted with him.

Answer to December Puzzle
OSTRICH

"WHAT IS IT?" ASKED THE SIGN ON THE BASKET

CACO, A RING-TAILED CAT

About a Strange Fellow with a History

by William L. and Irene Finley

Photographs by William L. Finley, Jr.

CROWDED in a small basket in a public market, for sale along with the big gunny-sacks of potatoes and head lettuce, and the boxes of peas, a little animal looked up with round, frightened eyes. It was a tiny creature, tawny in color with a pointed, fox-like face. But its crown of glory was a tail ringed around in black and white like that of a raccoon. This fluffy plume lay curled above its back and big eyes, the only shield from the shuffling feet and noisy voices. On the handle of the basket was a sign asking people to guess what it was. If some taxidermist had taken the characteristics of a cat, raccoon, fox and squirrel, and fashioned them into an animal and given it life, he could not have made a more perplexing paradox, for no one passing could puzzle out a name for it. This was not surprising for many naturalists have scratched their heads and systematists have stubbed their toes trying to untangle its mysterious ancestry.

A man had stopped and was looking down. The big eyes in the basket caught his glance and widened with fear at being observed. As Ben Hur Lampman, the writer, peered at the shy creature, so strangely out of place in the noisy mart, his mind flew back to the days when he lived along the Rogue River in southern Oregon. Here it was that his old friend, miner and hermit, of Upper Silver Creek, none other than the well known "Cap" Bivens, had stirred him with a story of a little woods cat that came to live in his cabin.

Cap was a kindly man, in love with all out-of-doors. At the time a pack rat that he called Willie was wont to slip in furtively along the rafters in the solitude each night, before the old hermit passed into the Land of Nod. Mornings, Cap would find with considerable dismay that Willie had made away with this or that small utensil or cherished doo-dad. Cap, however, still continued to be a believer in pack rats, even though Willie took his watch and then returned for the key. Next his long-tailed friend filched a final fragment of "yaller soap", and in the wee, small hours toward dawn the slippery guest was intercepted as he attempted his greatest coup, the abstraction of Cap's spectacles. The warm heart of his host was near wrath by this time. Came morning; Cap, shuffling about the cabin, distinctly remembered that he had left his ablest pipe on the pine table. He moved his hand tremblingly over the greasy surface, hoping for the familiar contact. In fear he adjusted his spectacles and peered closely. The pipe was gone! There was an oath on his lips that night, for he felt his confidence had never been so shamelessly betrayed by any living creature.

As the shadows from the fire danced high and red against rafter and log, Cap heard the rattling of papers in a corner and saw a critter, larger than Willie, with nose twitching and whiskers vibrating. Great-grand-dad of wood-rats, he thought, but as he peered again it was not the long, slender tail of Willie, with a whisk of hair at the end, but a big bush of black and white as striking as the plume of a peacock. Cap held his breath and

strained his eyes. Then as the flames died and the embers glowed, he heard a scuffle and a squeak, and he reckoned rightly that Willie and the new visitor had come to blows. No more did the wood-rat and the white-footed or deer mice make depredations upon Cap's meager supply of provisions. Each evening he laid out a nice strip of deer meat for his visitor, and would you believe it, the new arrival soon took it from his hand! After the evening meal, he curled up by Cap's bedside and purred just like a domestic tabby, the sweetest music that ever percolated through the old cabin. That is why he called his new friend "Percolator." Believe it or not, you could not buy that woods cat for a bag full of yellow dust—no sir!

WOULD MAKE A CHARMING PET
Brought up in domestic surroundings, Caco would be an interesting playmate

In the narrow confines of the little basket, subjected to the gaze of many people, and frozen into fear by the eye of a too curious one, Ben saw this little gnome of the woods, with ears small and erect, eyes bright, looking up from behind a tail of wonderful proportions. It must be the same rare little animal of Cap's story. Such a curiosity might well be gathered in for scientific purposes. Ben called upon the State of Oregon. State Game Warden Averill responded with keen interest, but by no stretch of imagination could the puzzling little fur-bearer be considered game; nor could the state be so lavish with its funds as to spend twenty-five dollars for the tawny animal with the palpitating whiskers. Knowing of our interest in wild animals Averill paid the bill and delivered the little prisoner to our friends, the Van Scoys, to keep until our return from New York. This is how we fell heir to Cacomixtle —Caco for short—curled up in her market basket, and here began her abode in our garage where a sack of chicken feed was always alluring to mice.

HE LOVES TO BE PETTED
But often he will start suddenly and slash about with his teeth

As I stood looking at the weasel-like, watchful face, I thought what a story could be written about Cacomixtle. One would have to begin far back in Tertiary times on the trail of life when there was an assemblage of little animals with bear-like or dog-like characteristics that might be called "coon-bears" or "weasel-bears." At an earlier stage in the history of this race of little animals, their progenitors were very much alike, for Cacomixtle is very suggestive of relationships. In fact, mammalogists have not really known what to call this little twenty-five dollar mystery to which we fell heir. Some have called him an American civet cat, but he is not really a civet, nor is he, in fact, a cat. In some places in the south he is called a cat squirrel, and in others a mountain-cat. One may find reference to him in the natural history records as bassaris or bassarisk. One well-known naturalist dubbed him raccoon-fox, which fits him fairly well, because his tail is like that of a raccoon with alternating stripes of black and white; but in size it is long and bushy like that of a fox. His nose and eyes are

also fox-like. His ears are not so large, but are erect and cat-like. But of all the names of this little puzzle, he is best known as ring-tailed cat.

Long before this little animal was discovered by anyone with a natural history bent, when the ancient Aztecs cleared places for their homes in Mexico, he came to live about the houses. Here he was called Cacomixtle, which means rush-cat or bush-cat. And he has survived long after these same stone houses and adobes have fallen to ruin. Since then he has become a haunter of lonely places and old buildings, ranging sparingly throughout the southwestern part of the United States from Mexico to southern Oregon. One may sometimes find little cat-like tracks in the dust and about the crannies and crevices of cliffs, where Cacomixtle hunts mice and other small game.

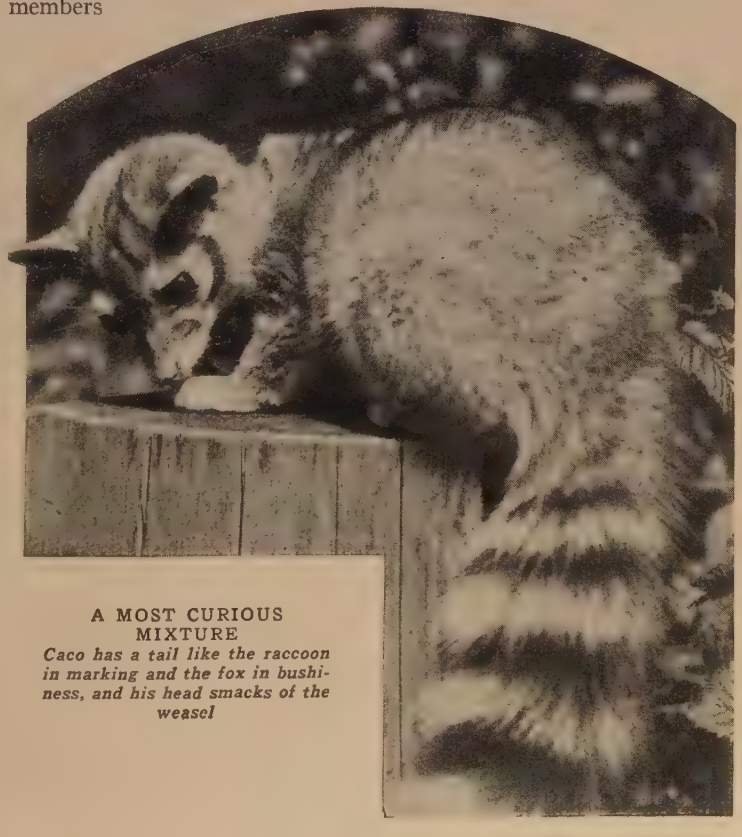
IT IS A TRULY NOBLE TAIL

Caco's brush is perhaps his most spectacular attribute, being as long as his body

Cacomixtle may not be an aristocratic name, and no blue ribbons have been bestowed upon him. Indeed, few favors have ever fallen to the lot of those animals that emit musk, and surely the little sprite that had come to live with us had a perfume of his own. Some naturalists claim that Cacomixtle is no relation to those members of the weasel family that have a strong, musky odor. He did not leave a trail as emphatic as that of a skunk, but surely it was a light reminder of a mink or weasel.

Fear had taken possession of Caco before we met him. Undoubtedly he had been raised by someone who had little understanding or love for wild pets, or he had been captured when nearly grown and could not lose his mortal terror of a human being. He loved to be stroked and petted. But at times when he purred the loudest, he must have dozed off to the land of dreams where sudden memories came to him of big animals that sought his life. Then his sharp teeth slashed when least expected. But at dinner time he was always amiable with a many-sided appetite like a raccoon. Fresh meat, eggs, milk, bread and fruit made up his menu. A tiny bit of sweetened whipped cream pleased him and he lapped it from a finger with his dainty tongue. This bill-of-fare, of course, does not take into consideration the mice that came too near his basket in the corner, for Caco was lord of the garage. One day a strange dog ran in the door. Up the side of the wall went the little ring-tail into a niche at the end of the rafters under the roof. From then on this was his favorite bed and lookout.

The cloak of night has concealed Cacomixtle so much that notwithstanding all the scientific explorations and investigations, few field naturalists have seen him. Some have trapped him and studied his hide and bones, but this has brought out few of his home habits and characteristics. In the warm southwestern deserts where the cactuses and mesquites and chaparral form dense thickets, the ringtail finds in these such shelter that he is able to range far from the rock cliffs that in most parts of his habitat offer him strongholds. In these environments he finds abundant rats and mice different from those of the cliffs, but, doubtless, of equal toothsomeness. In these places some hollow at the base of a thorny bush must form the retreat where the mother brings forth her three or four babies. How interesting would be a baby ring-tail! One of these curled up in a coat pocket and gentled day by day would be more alluring than a domestic kitten. In such a manner one might gain many facts that are unknown at the present time. This would be the way for the lucky naturalist to write the life story of Cacomixtle.



A MOST CURIOUS MIXTURE

Caco has a tail like the raccoon in marking and the fox in bushiness, and his head smacks of the weasel

SKIMMERS WHEELED AND FLASHED IN THE SUN
The air resounded with the barking, yelping notes that have earned for the birds the name "sea dog"

SKIMMERTOWN

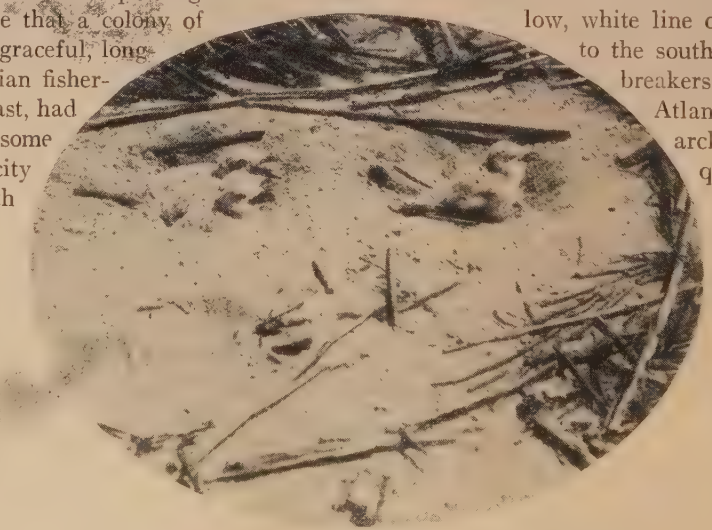
by Alexander Sprunt, Jr.

Curator of Ornithology, Charleston Museum

We stood enthralled at the sight that met our eyes. A wide, black-fronted phalanx of birds was rushing toward us. On it came, until, when within several yards, the army wheeled, the sun flashing on the birds' snowy underparts. The long red bills were wide open, while the air resounded with the barking, yelping notes of the disturbed birds. Small bunches and detachments now separated from the main flock. Individuals darted about us on all sides, each seeming to try to outdo the other in the amount of noise produced. The natural setting of the mighty waters, the expanse of sand under the blazing summer sun, the rush of the salt-laden breeze and the whirling, gyrating mass of birds all combine to make a picture which lingers long in the memory of one who is privileged to see it.

The rumor had come that a colony of black skimmers, those graceful, long-winged, beak-faced, avian fishermen of our Atlantic Coast, had located on a sand bar some distance south of the city of Charleston, South Carolina. And so, intrigued, three of us set forth to the beach on one of our barrier islands and for a four-mile row to find out for ourselves.

As we passed the mouths of small creeks, lovely snowy herons started into the air, their brilliant yellow feet, flashing in the sun. A majestic great blue heron flapped sedately over the river. Kingfishers rattled along the banks. A couple of willets flew close along the edge of the marsh, the white patches in the wings catching the light. High above us, on silent, outspread pinions, floated a single, keen-eyed osprey, scanning the ocean waters for his next meal.



THE YOUNGSTERS ARE HARD TO FIND
Their fledgeling coats of sandy-colored, brown-flecked down are a protection

Interesting as were these glimpses of bird life, we paid particular attention to the passing skimmers, all flying in the direction we were taking, and all carrying fish. Many passed within fifteen feet of the boat, flying close to the surface to avoid the wind, small fish crosswise in each bill. Whether by design or accident, every bird carried the fish with the tail to the left. These fish appeared to be about three inches long and were probably mullet. The skimmers which passed flying in the opposite direction all travelled high, taking advantage of the wind to hurry them back to their fishing grounds.

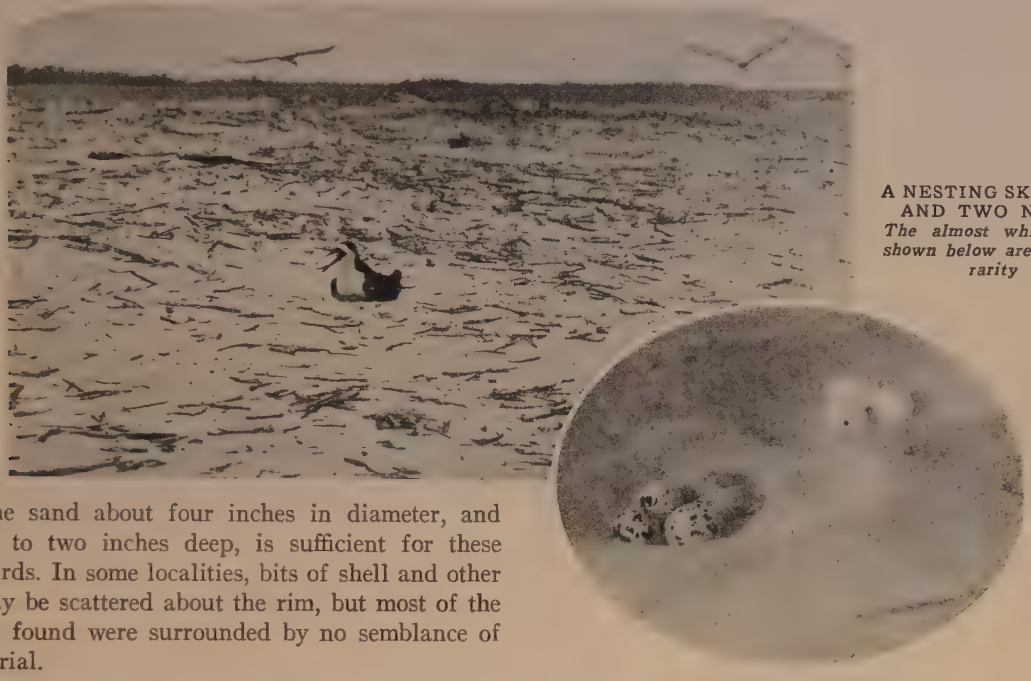
We rounded the end of the barrier island and came into the inlet which divided it from the next link in the island chain. In the middle of this inlet was the low, white line of a bank, while directly to the south was a creaming line of breakers, behind which rolled the Atlantic. Overhead was an arching dome of purest turquoise, fleecy white clouds moving slowly across it. The sunlight glinted on the little waves that lapped the bow of the boat. The whistle of the wind and the thunder of the surf, muffled by the distance, gave a lulling undertone to the cries of passing terns and the mellow piping of migrating shore-birds. Resting on the oars, we watched the homeward-bound skimmers, all making straight for the low white bank, which, soon, we also reached.

There, on the sand, about a hundred yards away, were hundreds of the beak-faced fishermen sitting upon their nests. Skimmers in flight and skimmers at rest present a vastly different appearance. All the graceful-

ness of the bird in air vanishes when he alights.

Suddenly, the whole multitude rose into the air, and made straight for us only to break ranks when about fifty yards away and sail by with barking calls. Their voices are hardly charming and have been likened to the baying of a pack of hounds, hence the name "sea-dog" applied to them in some localities. The yelping, nasal notes are anything but musical, and they never cease as long as one is in the colony.

While the birds wheeled above a multitude of nests lay before us. Anywhere, everywhere, were the slight depressions in the sand, each one holding three or four beautifully marked eggs. It is, however, a stretch of imagination to call a skimmer's home, a nest. A hollow in the sand about four inches in diameter, and from one to two inches deep, is sufficient for these strange birds. In some localities, bits of shell and other debris may be scattered about the rim, but most of the homes we found were surrounded by no semblance of nest material.



A NESTING SKIMMER AND TWO NESTS
The almost white eggs shown below are a great rarity

The eggs themselves are strikingly handsome. Three or four usually constitute a full set, but sometimes even five and six are found in one nest. They vary endlessly in marking. As a rule they have a creamy-white ground-color, heavily marked with splashes, blotches and spots of various shades of brown, becoming in some cases almost black. Paler markings of lavender sometimes appear, and are handsome. In fact, a series of skimmer eggs presents as striking an array of coloration as those of any other species.

It was a beautiful picture that surrounded us and we quickly set up the camera to make photographic records of some of the homes. Meanwhile numbers of birds kept flying by at close range, circling, wheeling and darting. Others sat on the sand nearby with alert, upraised heads. The more timid cruised about the bank in the shallows, not too worried, however, to drop the bill under water occasionally, and plow along in hope of a hasty bite to eat.

How large was the colony, we wondered, and so, dividing the breeding territory into two sections, we walked slowly straight ahead through the colony, each counting the nests. The homes occupied a space of about two acres, perfectly flat, except for a small pond in the middle. A few low dunes rimmed the eastern edge of the bank, these crowned with waving tufts of the beach grass, the only living vegetation visible. Bunches of drifted sedge, deposited by the high tides, lay scattered about the bank. Some of the skimmers had scratched bare places in the sedge, and had laid their eggs on the uncovered sand. Here, also, were quantities of washed eggs, thrown about by the tides which often destroy thousands of eggs and young.

Reaching the farther limit of the colony, we compared notes to find that we had counted two hundred and thirty-one nests with eggs, and about twenty with newly hatched young.

Among the many sets of eggs was one which would have delighted the heart of a collector. At a short distance this set appeared pure white. In fact one of the three was pure white, another had only two minute spots, and the third about three splashes of very pale-brown. Pale eggs are sometimes found in nests which hold normally marked ones, but a complete set of them is rare.

When the young skimmers first emerge from the egg, they have a beautiful coat of sandy-colored down, flecked with spots of brown. It requires a sharp pair of eyes to make out the ball of down, closely squatting and motionless. The young skimmers are adept at the art of keeping still, lying flat as the proverbial pancake, with the neck somewhat outstretched, the head to the front.

When we inspected the babies the parents tried frantically to lead us away. Many of us are familiar with the well-known trick of many of the shore birds, the nighthawk, and others, who flutter away over the ground before the intruder. With every indication of a broken wing, they still manage to keep just out of reach. These tactics the skimmers used,—a strange sight, indeed, to see these long-winged, red-beaked birds twisting and flapping about on the sand, seemingly hardly able to move. We would come within a few feet, then away they would flutter, crying in distressing accents, and in seeming pain. They would lead us about thirty or forty yards away, then spring into the air and wheel

away with the usual barking yelp, as if to say, "They are badly fooled now."

Even the youngsters have the peculiar bill of these birds, their outstanding characteristic. The mandibles are, at this stage, almost the same length, but show the knife-blade construction well. The young, when able to walk about, forage for themselves in the shallows, the even length of the mandibles making this possible. Prior to this stage they are fed on predigested food by the adults.

THE SKIMMERS ARE GRACEFUL IN FLIGHT

To see the majority of a colony in the air is to see an unforgetable sight

When able to fly, the birds have developed bills with the lower mandible considerably lengthened. They then resort to the feeding habit of the adults. This consists in dropping the lower end of the mandible in the water and skimming along close to the surface, gathering in the small fish and marine life, which serve for food, into the wide open mouth.

Scattered about the nests, throughout the whole colony, we noted many small spherical, white objects. Picking up several, we examined them closely. They proved to be compact little balls, made up of scales, vertebrae and small bones of various fish, and, although not held together by any glue-like substance, seemed to hold their shape, despite rough handling. These were evidently the undigestible portions of the birds' food which were ejected in the same manner as the pellets which owls regurgitate.

I have repeatedly looked for some comment on this habit in various bird books which contain accounts of skimmer life. I have been unable to find any reference to it. Audubon does not mention it, and subsequent naturalists have nothing to say of it. It seems strange that this, to my mind, very interesting fact has not been commented on by recent writers.

Like all other experiences, pleasant and otherwise, this one had to come to an end, and we reluctantly reloaded the boat with ourselves and equipment. We pulled away from the bank in the deepening twilight, filled with mental pictures of this wonderful town of fishermen. As we moved up the broad river behind the barrier island, slim dark forms glided by on silent, fitful wings, and an occasional barking chorus seemed, in truth, to bid us farewell.

Polyporus Builds Its Shelf

by S. S Dickey

Who has not met Polyporus, the shelf fungus, in one or another of our hardwood stands of trees? It is, of course, a degenerate, living upon the trunks of decaying trees, sending into the timber its skein of cob-web branches and surviving by breaking down the dead wood cells. Its name comes from the Greek which, translated literally, means pores. Indeed, if you will look on the white, chalky under-surface of this fungus you will find it perforated with many tiny holes.

A FAMILIAR FUNGUS

The shelves of Polyporus are seen in many woodlot of hardwood trees

Polyporus spreads itself and builds its new shelves through spores, wafted on the wind. These find lodgment on some tree and the shelf is begun. As the illustration shows, this interesting fungus adds yearly rings like the tree itself and thus reveals its age. Sometimes it will continue unmolested in its woods abode, adding its annual growth and gradually tearing down the vitality of the tree, eventually to return it dead to the earth from whence it sprung.

Lean Days in Birdland

VARIED THRUSH

by Carra E. Horsfall

Illustrated by R. Bruce Horsfall

THE CHEWINK

East or west, mid-winter is a time of uncertain living conditions for our feathered population. When sleet or rain has crusted drifts and tree-trunks, and has iced the snowy muffins atop Queen Anne's seed cups, then, if ever, must human friends come to the rescue with scattered seeds, suet bags, and feeding trays well stocked. Then is needed fare of rolled oats, fragments of suet, bread and cracker crumbs, sunflower seeds and ground grain.

Downy woodpecker and his western relative, Gairdner woodpecker, vie with black-capped and chestnut-backed chickadees as the best patrons of the cafeteria which specializes in suet. Varied thrush welcomes the center from a half apple and leaves only a rosy shell. Finches and buntings enjoy the seeds, while jays and starlings gladly accept scraps of any sort.

This is really the best time of all the year to begin the study of birds. Hearty appetites breed unusual confidence. Then, too, there are fewer varieties to confuse the novice, and, when one is taken into the inner circle of friendship by chickadee, waxwing, nuthatch, woodpecker and thrush, it is easy to widen one's acquaintance.

The ubiquitous English sparrow is a numerous subject. Brought into our country in 1850 against his will, he has made the most of his opportunities. The spirit of colonization strong within him, he has moved from center to center until there is scarce a place which he may not call home. His cheeriness and care for his family, and the fact that he will live in the most densely-populated city as well as in the open country lanes speaks much for his courage. Any cranny in wall, a fold in an awning, or a bird house built for other tenants, are alike desirable to him. The spotted white eggs number four to seven. Two or more broods are raised during the season which begins early. He is an efficient member of any street-cleaning force and a factor in the destruction of locusts. His chief fault is intolerance in the matter of neighbors. If there are bluebirds due to leave the nest in a box near his at about the time his own family is ready to fare forth, he has no compunctions about invading said neighbor's dwelling and executing the children.

The starling is another immigrant from across the Atlantic,—a much later comer than the English sparrow,—released in Central Park, New York in 1890. It is now scattered along the Atlantic coast and west to Chicago. It is a bird of striking appearance and voice, not easily mistaken for any other variety. Being able to withstand the rigors of our northern winter it may be seen in flocks all through that season. It is on hand to select the most desirable nesting places, supplanting bluebirds and other box and crevice-nesting birds. The young are out of the nest by the middle of May and are soon walking about seeking grubs and worms in the grass of lawns. In summer the bill of the adult is yellow and the light spots on the tips of the feathers wear away until the birds have the appearance of being black.

When snow flies and the thermometer drops we have visitors from the north. Jolly flocks of snowflakes blow in with the storms to help clean up the harvest of weed seeds which their migrant relatives have left behind. Their new winter feathers are edged with brown, making them inconspicuous among the dried weeds. As summer approaches these tips wear off or break away and leave the bird dressed in gay black and white. Sometimes they remain in the northern part of the United States as late as the middle of March, but usually leave for their far northern breeding ground as soon as the snow begins to melt. They are found throughout the circumpolar region nesting upon the ground where they place their four to seven pale bluish eggs in a moss-lined hollow.

WOOD THRUSH NEST IN WINTER GARB

The American crossbill is most erratic in its choice of dwelling place. One year it appears here, and another, in quite a distant locality. At times it will spend the winter considerably south of its expected limit, due, perhaps, to the failure of the food supply. This food is the seed of conifers and the bills of the birds are specially constructed to pry off the scales and release the seeds. The young birds are not truly migrants for they seem to nest wherever they chance to be when nesting-time comes. The male does not help in nest-building but is always close at hand to encourage his mate with song.

Soft feathers lie smoothly against the body of the well-groomed cedar waxwings. During the winter they travel in flocks made up of a number of families which join forces as soon as their late nesting season is over. The breeding range is from central

Blue Jay—*Cyanocitta cristata*

Snow Bunting—*Plectrophenax nivalis*

Crossbill—*Loxia curvirostra pusilla*

Downy Woodpecker—*Dryobates pubescens*

Brown Creeper—*Certhia familiaris*

Starling—*Sturnus vulgaris*

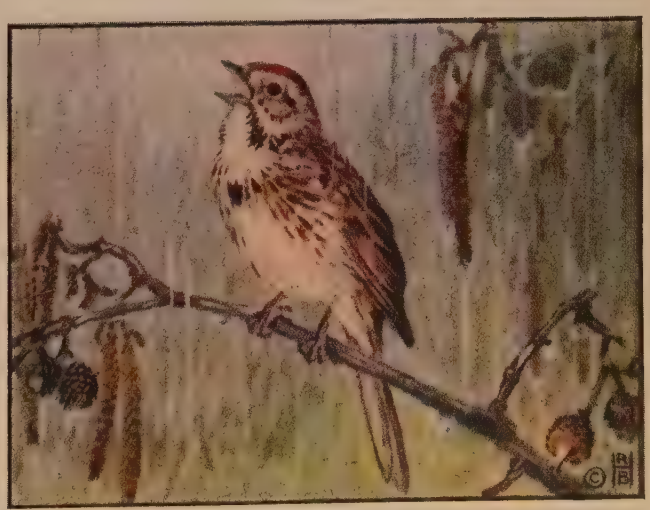
CEDAR WAXWING—*Bombycilla cedrorum*

HOUSE or ENGLISH SPARROW—*Passer domesticus*

WHITE-BREASTED NUTHATCH—*Sitta carolinensis*

TUFTED TITMOUSE—*Baeolophus bicolor*

TREE SPARROW—*Spizella monticola*



SONG SPARROW—*Melospiza melodia*

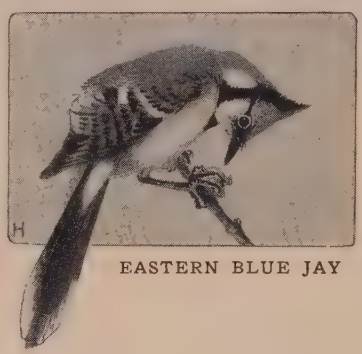
DOWNY WOODPECKER

United States to the southern shores of Hudson Bay, across Canada east and west. Their winter food is the fruit left hanging on trees and bushes. Mountain ash, dogwood, and black haw are among the favorites and a flock of waxwings stay about until the supply is exhausted. In summer they have the interesting habit of fly-catching and will remain for hours on a bridge railing darting out over the water for passing insects. Being exceedingly fond of cherries, wild or tame, they are not popular with fruit growers, but the fact that they destroy countless numbers of canker worms and hairy caterpillars, shunned by most birds, speaks for their protection.

On crisp frosty mornings after a storm has left the ground white and sparkling with snow, the clear call of the tufted titmouse announces the fact that he is hard at work hunting out insect eggs and such small creatures as spend the winter months hidden away in crevices. This activity is a year-round job with his tribe so that the good he and his cousins the chickadees do, is hard to estimate. Though they are tiny they are numerous, often there will be two broods of five to eight in a season and the whole family travels together throughout the winter. They nest in deserted woodpecker holes or the hollows of old stumps.

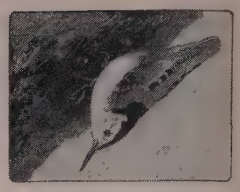
The white-breasted nuthatch, another bark comber, is also with us throughout the year helping to keep our deciduous trees in good shape. Up or down or sideways upon trunk or limb he probes for insect larvae, beetles, moths, and eggs. He will visit a feeding tray for rolled oats, sunflower seeds or crumbs and suet which he carries away to store in chinks for future use. The nuthatch nests in some cavity either near the ground or far up in a tall tree. This home is lined with felted hair, feathers and soft leaves. There are five to eight eggs. Slender-billed nuthatch, the western cousin, is similar in habits and appearance, and together they administer first aid to the trees of their vicinity throughout temperate North America.

Brown creeper is the one species of his family to be found in America. Five sub-species, almost identical in habits and characteristics, range throughout Canada and United States and from Alaska well into Mexico. Seeking tiny creatures which live or hibernate in the bark of trees, the long, slender, curved bill is used to search every crevice for hidden treasure. Someone has aptly called the path taken by the bird, as it hitches itself up and around the tree trunk, a spiral stairway. The long tail serves as a brace to aid in its progress. This bird is practically a permanent resident in most of its breeding range, therefore is exceedingly useful in ridding the trees of enemies missed by the regular summer boarders. The nest is usually placed behind a piece of loose bark and is lined with feathers and stripped bark. There are five to eight creamy, brown and lavender freckled eggs.



EASTERN BLUE JAY

Downy is the smallest, most common and one of the most useful woodpeckers, being of inestimable value in the destruction of insects which infest the trees of our orchards and groves. He not only performs this service in summer but feeds upon eggs and larvae secreted in crevices during the winter. Though he ekes out a fairly good living, he will visit your suet basket or search for small pieces you have pressed into the ridged bark of some dooryard tree. When spring comes he and his mate nest in a hole dug out of dead limb or stub where they raise a family of four to six children.



WHITE-BREASTED NUTHATCH

The tree sparrow visits the United States only during the winter, for he raises his family of four or five babies in a hair-lined grass nest placed in a low bush or on the ground in the north country of Canada. He is sometimes called the snow or winter chippie being almost as small as the chipping sparrow and quite similar in color and markings. He finds abundant food in the heads and clusters of weed seeds which rise above the snow-covered land. He and his kind often join the juncos, goldfinches and song sparrows in their feeding expeditions. The tree sparrow has a song which resembles that of the goldfinch. This he sings to us during the season when most of our birds are songless.

One striking exception is the song sparrow. Rain or shine, summer or winter, he cheers us with his varied notes. Often at night he arouses enough to send an answering refrain when disturbed by owl, chat, or any night noise. He lives over most of North America in one of the many subdivisions of his family, his coat varying according to the humidity of his environment, darker in the moisture-laden coast regions, lighter in the dry, arid, upland interior. Particularly fond of brushy growth, he is found along streams and marsh edges where hardhack and other spireas abound. His nest, placed on the ground or in some low bush, may contain four or five speckled eggs.

A flash of blue against the white of snow-covered branches, the raucous call of *jay, jay, jay,* gives tang to a morning walk. He is a most beautifully colored bird with his jaunty crest, black collar and white trimmings, and he certainly does his share to liven the winter landscape. He loves feeding-tray fare, and carries off more than he can possibly consume at the moment. In summer he and his mate have little to say for they do not wish their treasures discovered. He is a permanent resident through the eastern and great plains regions of North America. One habit should commend him to conservationists. He tucks acorns, chestnuts, hickory-nuts and other sorts under leaves or earth. Many are forgotten, so all unwittingly the jay becomes a member of the tree-planting army.

SNOW BIRDS OR JUNCOS

CHASING RAINBOWS
This time it is the rainbow trout, however

FINGERLINGS and FRY

What our Bureau of Fisheries is Doing to Stock our Streams

by James N. Miller

DESPITE the depletion of our fishery resources resulting from pollution, deforestation, reclamation of swamps and bayous, and other factors, our government is gradually but steadily building up a cooperative fishery program that takes in not only the 48 states, but private individuals and organizations as well. More than that, foreign countries constantly call on our fisheries bureau for expert assistance. Everywhere the state and private agencies are responding to Mr. Hoover's and the fisheries bureau's hearty invitation to "get, free of charge, from the Federal government any instruction, advice, breeding stock and fingerling."

This is no small promise when it is realized that some ten million fishermen annually seek in our waters their favorite finny swimmers.

Too few people realize the varied and important work being carried on by the United States Bureau of Fisheries. It is hoped that this article by Mr. Miller will give a better understanding of this work.

Let no one think the promise is being idly received. Yearly an average of from ten to fifteen thousand applications for fish come from private individuals, fish and game clubs and states. Moreover, our state and national governments spend nearly $2,000,000 on game fish hatcheries.

Now let us turn to the government's direct participation in fishery improvements. Working with remarkable foresight and precision are the five divisions of the fishery bureau of the Department of Commerce; the Administrative, the Alaskan, the Division of Fish Culture, and the divisions of Scientific Inquiry and Fishery Industries.

Propagation and comprehensive spread of fish are the primary functions of the Division of Fish Culture. Last year the output of eggs, fry, fingerling and adult fish totalled some six billion, five hundred million. A large share of this output consisted of eggs salvaged from cod, flounder, and other marine fishes of high commercial importance.

The spawn of such fresh water and river-running fish as the whitefish, ciscoes, shad and their fellows, is obtained largely from the commercial fishermen in return for certain benefits granted by the government. In the case of game fish the eggs are obtained from brood stock at the bureau stations, and from wild stock secured by Bureau employees by purchase or exchange.

There is free exchange of eggs between the Bureau and the states. For instance, it may so happen that for one area the bureau may have trouble in getting an adequate supply of trout while another may have plenty of trout, but very little pike or perch. It is obvious what is done under such circumstances.

Last year the Bureau's distribution cars, five in number, travelled 63,000 miles and detailed messengers

carrying fish covered nearly 364,000 miles. Trained messengers are detailed from the regular station force.

The distribution cars have no fixed central location but distribute the output of the stations as the occasion demands. Each is provided with tanks and buckets for transporting fish, with proper means for keeping the water aerated and cool. Adequate arrangements for the convenience and comfort of the crew who live aboard is provided. This includes office, kitchen, and sleeping berths.

Environmental conditions of fish are the chief concern of the Division of Scientific Inquiry. It is striving to keep informed as to the condition and trend of each important commercial fishery for the guidance of the states in making legislation properly to husband this great resource.

Purely on their own part few states have undertaken a comprehensive investigation of their fisheries. They look to the Scientific Inquiry Division for that. Recently South Carolina asked the Bureau for aid in developing her oyster fisheries, which resulted in the sending of an oyster specialist to study the situation and the mapping out of a definite program for building up this industry.

An important phase of the Bureau's work is the supervision of state collection of fishery statistics. So vast is the scope of our fisheries that the Bureau cannot, purely on its own resources, make a complete yearly canvass of conditions. The states are encouraged to cooperate by collecting their own data, and sending their reports to the Bureau, for completion by states, waters and species to give the complete picture of what is happening.

Persistently the Bureau emphasizes the need of uniformity in state gathering of statistics. Particularly, is this important among the lake states where the government wants to know the output of fish per lake as well as per state.

California is something of a banner state in statistics gathering. For about six years now it has collected fishery statistics in a very comprehensive manner. It has a unique receipt system of statistics gathering. Records of every fisherman's sales are made in triplicate. The buyer keeps one, so does the fisherman, and the third is sent to the state for its records.

Little Connecticut rivals California in this regard. Three years ago the state took an important step by sending a representative to spend several months in the Government Bureau, making an intensive study of government procedure, and now collects its own statistics annually. Florida also has a state system of collecting statistics. In Maryland a novel system was installed at a recent legislative session. A bill was passed creating a state paid auditor to audit the books of fishing companies, make certain the payment of all fishery taxes and tabulate the catch returns.

Maryland has had her share of perplexing fishing problems. A few years ago the famed Chesapeake Bay soft shell crab catch was on the downward grade. Government experts were called upon. One wasteful practice in particular was noted. Shedder floats, where crabs are placed in the initial stage of shedding, were being used carelessly by certain commercial interests. Instead of placing in the floats only those crabs that were starting to shed, many with mature hard shells were added with the inevitable result that a great many died. Government corrective measures soon reduced the mortality about fifty per cent, thus saving the industry.

ROCK BASS SWIM CONTENTEDLY ABOUT

Their relatives, the black bass, are among the most popular fish and most difficult to propagate

About two years ago, Secretary Hoover inaugurated a system of cooperation between the Fish Culture Division of the Bureau and the numerous fish and game organizations. The general plan is to encourage them to use their waters to produce game fish, the work to be done either under the direct supervision of a trained fish culturalist or by occasional visits of Bureau experts to give advice. The understanding is to divide the annual output, the association stocking its streams with its share and the Bureau stocking other streams in the neighborhood.

Although there is no hard and fast rule about it, the Bureau prefers to ship fry (newly hatched fish) of which it has a surplus, to private interests to be grown by them to the fingerling (fish several inches grown) stage. The reason is that the Bureau can transport in one car ten times as many fry as fingerling and lacks pond areas for growing its output to the fingerling size.

In general, if the government is aiding the launching of a new cooperative enterprise it gets in touch with the situation. The first step is to gather accurate knowledge of environmental conditions such as quantity and quality of water supply, its source and volume, maximum temperature during the summer, how it may be impounded, whether the nursery ponds or lakes will be subject to freshets, and to what expense the promotors would be willing to go in attempting fish cultural work. Government experts keep closely in touch with the new enterprise and render all practicable aid to insure its success.

The matter of proper foods is a popular subject regarding which the government is conducting scientific studies. It is determining the relative feeding value of beef heart, beef liver, sheep's heart, shrimp meal, and fresh water mussel meats. The finding will be valuable.

Human beings are not the only living organisms whose proper development at times requires cod liver oil and yeast. During the past three years numerous government experiments have proved these human correctives have a place in the diet of fry.

At the present time the government fish doctor, Mr. H. S. Davis, is stationed at Holden, Vermont, where a government hatchery has been turned over to experimentation with growing trout without regard to output, but with the object of improving present practices. Careful comparative records are being kept of the results; diseases are studied and means of control developed; by selective breeding an effort is being made to produce a superior stock of breeders.

European countries are requesting us to supply them with eggs or fish, such as the top-minnow, extremely valuable in checking malaria because of its liking for the mosquito larvae as food. Shipments of this fish have been supplied to Spain, Italy, San Domingo and even far-off Palestine. Japan has received a quantity of rainbow trout eggs.

Usually fish are sent to foreign countries in large, well aerated tanks. When a country accepts fish stock from Uncle Sam it is with much the same sort of understanding that the various states work upon—that it will take care of the expenses of packing and transportation.

One of the big problems of the Fishery Bureau concerns the propagation of black bass. Because of its growing popularity it is becoming harder every year to get an output from the hatcheries sufficient to meet the demands. As a consequence applications not infrequently must be carried over from one year to the following.

ROCK HIND AND RED HIND IN AQUARIUM

The rock hind is a good food fish and is found from Florida to Brazil, frequenting rocky places

One of the difficulties in the face of proper increase of this popular species is the fact that a practical way of effecting the artificial fertilization of bass eggs has not been found. Moreover, their natural spawning areas are being encroached upon by drainage of the swamps, bayous and other natural nursery areas, and the emptying of commercial wastes into the watercourses until some of them are little more than open sewers.

GROUPERS ON THEIR FINNY WAY

They seem to have a snobbish expression but they are not really that way

Fortunately the states are coming to realize that they must make better laws for the protection of their bass supply. According to Glen C. Leach, Assistant in Charge of the Division of Fish Culture, unless they are protected during the nesting season, their size limit increased and the bag limit reduced, it will be only a short time until the species will be depleted in many of the public waters. Moreover, natural propagation must be assisted by the institution of better spawning places.

A major hope then, for bass preservation, lies not with the government but with the people. There are numerous places where bass may be successfully propagated under natural conditions. Many sections of the country have swampy places and depressions which could be well used as ponds if a dike were thrown up and a suitable outlet and overflow constructed. Water might be drawn off through a drain gate or taken from the pond by means of a centrifugal pump of large capacity.

Cannibalism is all too frequent among fisheries conducted by novices. Oftentimes it happens that the government furnishes enough fish to establish a good brood stock, but the small fish thus supplied are devoured by the larger fish because of insufficient food supply. The moral here is obvious.

Through every available means the Bureau of Fisheries is seeking to keep our streams and lakes stocked with fish, to add to the joys of the outdoor life by providing good fishing and to shorten the time between bites. Its seventy stations and substations are being operated at full capacity, state hatcheries are being aided in every practicable manner through the interchange of eggs, loans of equipment and of the Bureau's experienced personnel, and private organizations are encouraged to take a part through the establishment of cooperative fish nurseries. In addition, international amity is being promoted through the distribution of eggs to a number of foreign governments.

PATIENCE BESIDE A STERILE STREAM

TELLTALE TRACKS

Morning after the first snow holds much to be photographed

THIS is the first of a series of articles on photography written especially for NATURE MAGAZINE *by photographers eminent in their work. They will be practical and suggestive to all who use a camera. Also in this issue is inaugurated the new Photographic Department edited by Mr. Brownell, and to which you are invited to appeal for any advice along photographic lines. Look for the department.*

WINTER SUBJECTS for the CAMERA

By L. W. Brownell

Photographic Editor, Nature Magazine

Illustrations by the Author

RABBIT TRACKS

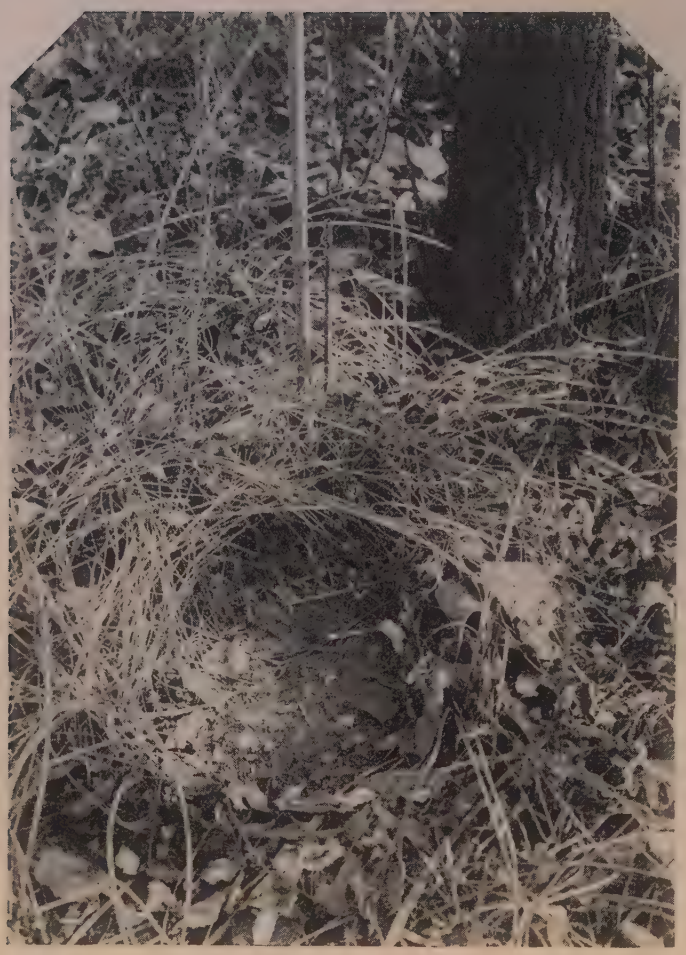
What is the story of the night that can be read in the snow

WHY is it that so many owners of good camera outfits use them assiduously during the summer months, pack them away along with their summer clothes as soon as cold weather comes and never bring them out again until spring reigns again? Is it that they prefer the steam-heated indoors to the invigorating cold of the outdoors? Or do they imagine that there is nothing to be found in the winter woods and fields worthy the effort of finding and photographing? Whichever the case, they are missing some wonderfully pleasant and health-giving experiences, and are very greatly mistaken.

Of course there are not nearly as many subjects to be found in the winter as in summer, but there are many things that cannot be found at any other time of the year. He who would have a good collection of Nature photographs must keep his camera out of the cotton batting and take it with him on tramps through the woods and fields during the winter months. If he but use his eyes intelligently upon these tramps he will be very greatly surprised at the number of new negatives that he will be able to add to his collection.

Perhaps many will be surprised at the assertion that there is much that can be accomplished during the winter in photographing plant life. One interested in trees must photograph the naked forms at this time. There is no better time to make photographs of the trunks than when they are not shaded by the mass of foliage. There is one small tree, or shrub, whose flowers can be photographed at no other time for they bloom in November and may often be found as late as the latter part of December or the first of January. I have frequently found them in full bloom with the snow a foot deep on the ground. This is, of course, the witch hazel, that anomaly of plant life of which we find it hard to say whether it is the first or the last to bloom. Go hunt it out.

There are the Lycopodiums, or club-mosses, of which probably the best known, from the fact that it is so extensively used for Christmas decorations, is the trailing Christmas green. This was once extremely common in many localities in our woods, but since it has been pulled up so ruthlessly for Christmas decoration, patches of it are rare. It is worth the effort to seek it out for the making of a good photograph. Another member of this family, also extensively used for Christmas decorating, is the ground pine, standing erect for from six to twelve inches. Even when the snow is several inches deep it will frequently stand above it for half its length or more, making a very beautiful sight in the winter woods. There are ten or a dozen species of these plants to be found in the United States, but these two, together with



the shining club-moss and the running pine, or common club-moss, are the four that we are most apt to find during a day's tramp in the woods.

These, however, form a small part of the army of plants that remain green, at least in part, throughout the year. There are many plants, especially among the perennials, that put forth their basal leaves in the fall. These remain green throughout the winter and from them the stem of the plant arises in the spring. These basal leaves take the form, in almost every instance, of a rosette, some of them very regular and beautiful. They all make most interesting photographs and may be photographed at any time before the snow covers them. They are extremely numerous, more so than one might imagine until he searched specially for them. I once made photographs of twenty species in a three hour's tramp through the fields near my home on a day in late December. In doing so I passed by hundreds that, from some imperfection of growth in leaves or shape, were unsuited for my purpose. In photographing these growths one should invariably select only such rosettes as are perfect. The tilting camera top must be used as the lens must be pointed directly downward at the plant in order to show its shape and the arrangement of the leaves to the best advantage.

A RABBIT "FORM" IN THE WOODS
The winter photographer is paid for a tramp when he can make such a film record

(BELOW) FRUITING HEADS OF THE NARROW-LEAVED CAT-TAILS
When summer has gone subjects for photographing have not gone with it, for here is a charming subject to snap

There are the seeds of many plants, especially those that produce berries, that can be photographed late in the fall and early winter. In the swamps are the cat-tails, whose seeding heads stand straight and tall throughout the winter and, to those who are interested in the fungus growths, there are many that can be photographed up to, and even after the snow falls. Altogether one can hardly say that the winter season is entirely devoid of plant life subjects for the nature photographer.

Shortly after the sun rises, on a morning after the first light fall of snow, one should take his camera and start on a search for animal tracks to photograph. They make not only interesting but valuable records in the life history of any animal. We will have but little difficulty in finding them for they are literally everywhere through the woods and fields, in some places so numerous that the surface of the snow is criss-crossed with them leading in every direction. A camera with a tripod must be used in order to photograph these tracks successfully. They should be photographed against the sun or with the sun shining at right angles to them, never with it directly behind the camera, in order that the shadow thus formed in each foot-print may make it stand out with the greatest distinctness. The camera should be placed as near

WINTER HOME OF THE WHITE-FOOT MOUSE
It is fascinating to seek out such a subject on a tramp over the fields

(BELOW) WHAT HAS HAPPENED DURING THE NIGHT?
The camera will record such wild world tragedies as these remains of an owl's meal

the ground as possible in order to include the maximum number of footprints in the picture. The focus should be made on the footprint three or four removed from the first one that shows in the image. The lens should then be stopped down to the smallest aperture and a short exposure, not exceeding two or three seconds, given. To me the tramp in search of animal tracks to photograph, and the photographing of them, in the crisp, bright air and beautiful sunlight of a mid-winter's day morning, is one of the greatest sports that one can have with his camera.

A few years ago I was asked to illustrate a talk on the winter wild things. Upon looking over my negatives, while I found many that would answer the purpose, I did not find quite as many as I wanted and I therefore decided that we, my camera and I, would take a day off in the woods and fields. I had been wanting an excuse to do this for some time and here was a perfectly valid one made to order. Although it lacked only two days of Christmas, no snow had fallen, but the next day, bright and early, found me afield, breathing the tonic air of the morning.

THE GROUND PINE PEEKS OUT
There are many botanical subjects that can be found for the camera in winter

One, or I had better say, several of the things I hoped to find were the winter nests of the rodents. It may be that all of my readers do not know that it is a habit of the little white-footed mouse to utilize old birds' nests—which they dome over with dead grasses and leaves and line with soft material—as well as old stumps. It was one of these nests which I wished most to find and luck was with me for, in passing through a piece of woodland not long after starting I saw the nest of a wood thrush that looked as if it had been domed over. I found, to my joy, that it had and, upon giving it a little shake, the white-footed owner popped out and scurried away. I did not want him, however, but his nest, or rather a photograph of it, and it was the work of but a few minutes to set up my camera and make the exposure. Later I found another, composed entirely of a mass of white cotton waste, completely overflowing a nest of the brown thrasher swung in a tangle of cat-briar vines. So conspicuous was it that I saw it while still more than a hundred yards away.

Leaving the piece of woodland, I headed for a small meadow where I had hopes of finding some of the nests of the meadow mouse. In September the grass here had been high but it was now dead and beaten flat by the autumn rains. Underneath, the runways of the mice ran in every direction, a veritable labyrinth. It is possible for one to follow one of these runways and have it bring him back to where he started from but I was more fortunate and, after having followed one for some yards, it led me directly to the home of its little maker, a compactly woven ball of grass half buried in the ground and completely hidden by the dead grass that covered it. An exposed negative of this nest was soon in my carrying case and I was again on my way.

In one part of the meadow was a small pool partly surrounded with cat-tails. In these I was lucky enough to find the nest of a red-wing which had been preempted by a meadow mouse. I still wanted a nest of the white-foot in a stump and I started looking for it. The first stump I found I gave a vigorous kick only to have it literally crumble to dust at my feet. The second one had a suspicious looking hole in it and I treated it more gently, merely tapping on the outside, but that was sufficient to bring forth its owner who jumped to the ground and hurried away. Now I knew that there was a nest in the interior of that stump and I wanted a photograph of it. Also I did not want to deprive the little owner of it. I therefore hit upon the expedient of splitting off a small portion of the stump with my knife and, after having photographed the nest, I replaced the piece, tacking it securely to the stump with a couple of strong pins. I have little doubt but that the white-foot returned and occupied the nest all the rest of the winter.

Cutting across a wooded hill to another swamp in which I knew that I would find the winter house of some muskrats that dwelt there I scared a cottontail from his "form" in the dead leaves and undergrowth. Later in the day I started another bunny in the middle of an open field and was able to obtain photographs of two distinct types of "forms". My muskrat's house was where I expected it to be and on a bank but a short distance away was the entrance to a woodchuck's burrow both of which made first class subjects.

Later I found, and photographed, a gray squirrel's nest in a tangle of vines; a red squirrel's nest in the

top of a small cedar; the entrance to another woodchuck's hole under an old stump; the entrance to a fox's holing up place under the exposed roots of a huge old chestnut tree, and several other good subjects, so that, before reaching home well after dark in the late afternoon, I had used up all of the two dozen plates which I had carried with me.

There are tragedies constantly occurring among the wild folk and evidences of these are often found by him who tramps the open and especially is this true of the winter months. One morning, after a particularly cold night in January, I was afield with my camera. In a crotch of a small sapling I found a dead nuthatch, hanging by his neck. Probably partially overcome by the cold he had either fallen or fluttered into the crotch where he hung, too weak to extricate himself until either frozen or strangled to death.

On another morning, while passing through a piece of woods, I found the remains of some owl's midnight feast on the flat top of a tree stump,—the head and hind quarters of a short-tailed shrew. All the rest of it had been devoured. All such subjects make interesting records of the winter life of the wild things.

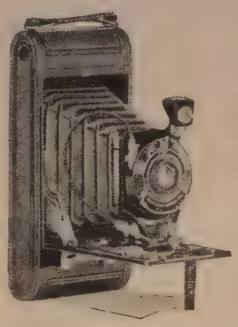
Altogether I do not think that any one can accuse me of exaggerating when I say that, for him who has the courage and energy to tramp the country on days when the mercury is searching for the bottom of the thermometer, there are plenty of subjects to be found.

PICTURE-TAKERS ATTENTION!

Contest for All Who Use a Camera Successfully

Here is an opportunity for all of the members of the American Nature Association and readers of Nature Magazine. It is a photographic contest, with awards and publication for the winners.

Read This Announcement Carefully



EACH month NATURE MAGAZINE *will make awards for the five best outdoor photographs submitted. These awards will be a first prize of $10, a second of $5, and three third prizes of a one year's membership in the American Nature Association together with* NATURE MAGAZINE.

In proposing the contest the officers of the Association are acting on their conviction that one of the most potent factors in preserving the beauties of the out-of-doors is through creating a deep-seated public appreciation of these beauties, and the wild life that is in them. This appreciation is inevitably fostered by the taking and publication of pictures of natural glories. Our readers can help by entering the contest, totally aside from the consideration of prizes.

RULES OF THE CONTEST

The contest is now open. The first awards and pictures will be announced and published in the April issue. Pictures for that issue must be submitted on or before February 1. Pictures for the May contest before March 1; for the June contest before April 1; for the July contest before May 1; and for the August contest before June 1.

Outdoor pictures will be considered. They may be of wild life,—birds, mammals, insects etc.,—or may be scenically beautiful or remarkable.

Pictures for return MUST BE accompanied by return postage and NATURE MAGAZINE *cannot be responsible for pictures lost in the mails or damaged through improper mailing.*

Pictures should be addressed to: Photograph Editor, NATURE MAGAZINE, *1214 Sixteenth Street, N. W., Washington, D. C.*

SPECIAL CONTESTS

An Outdoors Good Manners Photography Contest will be conducted, closing July 15, with publication in the September issue. Photographs in this contest should show either unsightly billboards or roadside stands, carelessly left camp sites or picnic places or other desecrations of the outdoors; or the reverse in the form of unobtrusive stands and other successful attempts to make commerce conform to outdoor beauties. Awards will be the same as in the monthly contest. Photographs should, however, be marked to indicate that they are meant for this contest.

A Garden Photograph Contest will be conducted, closing August 15, with publication in the October issue. Photographs should show attractive gardens and design. Awards will be the same as in the monthly contest but photographs should be plainly marked if they are designed for entry in this contest.

Other rules applicable to the monthly contests apply alike to these special groups.

THE TALE of STUMPY the SWIFT

by Drew Sherrard

STUMPY GREW TO LIZARDHOOD

IT IS a tale that begins on a certain hillside above the Willamette River, in Oregon. The slope is strewn with great basalt boulders, old and weatherworn, green with mosses and gray with lichens. Ferns grow among them, and stonecrops cling to them, beautifying their gaunt sides with rosettes of soft gray-green foliage. And down in the deep crevices of them live many small earth folk.

Here it was that a lizard made his home, a happy home, well suited to his needs. There were rocky terraces where he could sit and sun himself; shady, cushioned retreats where he could lie, seeing and not too much seen, and watch for his dinner to come strolling by on six legs or floating past on gauzy wings. Beetle, milliped, and pillbug; fly, grasshopper, or slug—all were grist for his mill. And when storms came and rain beat upon the rocks, what safe crevices he knew for shelter!

The long summer days seemed to fly by. From that April hour when returning warmth tingled in the little cold body and called it out into the reborn world of spring, until September's chill descended again, it seemed but one swift, bright day. Yet there was time enough to eat and grow; time to dart swiftly over rock, stump, and bank; time to bask with half-closed eyes in the sun; time to find adventures with his little reptile companions; time, in short, for the business of life.

And so, in the course of several such summers, the swift grew to adult lizardhood, and his length was some seven inches. The scales that clothed his agile body were small and close set, those over the back having each a little keel or raised tip, which gave a rough surface on his upper parts, thus definitely placing him in the tribe of the swifts, or rough-scaled lizards, not among the skinks, which have smooth scales like the snakes.

Except for three patches of bright blue, one under the throat and one on either side of light-gray belly, his color was a dark, gunmetal gray, faintly streaked with brown and black on the back, and giving out metallic gleams when the sun shone on his curves. The same blending of gray and brown could be seen on the bare sides of the weathered stones, and when the swift used to flatten himself out against them and cling there, he was hardly visible. This was a gift from Mother Nature, the gift of protective coloration, and he made the most of it.

It was not hard to cling upon a sheer face of rock, although he had not the disks on his fingers and toes that some lizards have. Instead, each skinny digit ended in a curved and pointed claw that caught and held perfectly among the inequalities of the rough rock.

There was another gift that he had received from the same kind parent, and it was in the using of it that the little swift won his name. For during all this time of eating and growing, he had never had any name, at least none except his tribal name of *Sceloporus occidentalis,* and there were no learned scientists upon his hill to call him and his little kinsmen by it. But there were happenings that led to the naming of the swift, and they must now be set down in order.

On a certain day there came men with tools, who cut down the bushes and stunted oaks that grew among the boulders. With iron bars they pried away the boulders, until they had cleared a space of ground. Other men followed these, and with pick and shovel and explosives, dug a great hole in the hillside. All the little live things fled before the comers, to take refuge in leafy covert, hollow log, or crannied rock, and from there to look out with bright, anxious eyes.

But this was not the end of it. Still other men cut boards and built a house, and humans came to live in it, on the spot where the swift had had his home before them. Below the house they made a garden and a terrace, and the wall that supported it was built of the very boulders that had been the swift's sanctuary. Between the stones of the wall the people planted rockflowers to paint it in spring with bright patches of color.

And the little swift, returning to his hearthsite, looked upon it and found that it was still a pleasant home, with crannies to hide in, and bugs to eat. Looking out from his flowery wall, he saw the humans come and go, until he feared them no longer. When the woman dug among the plants, the swift would draw nearer and watch her until her busy trowel unearthed a fat grub or a panic-stricken angleworm; then he would dart over and seize the morsel appreciatively, and make a meal of it.

One day he and the woman shared the same mishap. Some yellowjackets had started housekeeping in the stone wall, and quite unintentionally, the woman annoyed one of them. In an instant, she was nursing a sting on her wrist. The swift, coming along just then, saw a yellowjacket alight at the edge of the crevice and go inside. All alert for an insect meal, he hurried to the spot just as another homing wasp arrived. Instantly he snatched it up, but as his little teeth closed down on the prey, the wasp's sting went into action, and the surprised little lizard hastily spat out his redhot meal. The yellowjacket was done for, but in death it had achieved revenge. For some moments the swift remained there, opening his mouth from time to time, and licking his lips in a distressed way; then finally he turned away, to seek shelter in his own cranny.

A TAIL THAT SERVED WELL

Gradually a friendship grew up between the woman and the swift. Each, it is true, preferred to keep the other at a slight distance, but their mutual feelings were friendly. So in July, when the woman found in the moist earth, under a maiden pink, a little nest of dirty white rubber-shelled eggs, and recognized them for the treasure of Mrs. *Sceloporus occidentalis*, she left them there to complete their six-weeks period of incubation, and to turn into inch-long lizardlings.

So, also, when the swift himself crept into a rug that was being sunned on the terrace, and was brought into the house with it, she quite kindly tried to show him the way to the open door. Confused and terrified by the strange surroundings, he ran every way but the right one, while she tried vainly to drive or catch him. At last he took refuge in the ashes at the back of the cold fireplace, and then—because the race is not always to the swift—she caught him.

Taking him up by the tip of the tail, she walked toward the open door to put him outside. But to her amazement and horror, the swift gave his body a backward snap, just like cracking a whip, and set himself free indeed, but without a tail! Between her finger and thumb she still held the tail, wriggling violently, while its late owner, with a tiny drop of blood on his stump, scuttered out the door to safety.

She ran to the door, crying remorsefully, "Oh, you poor little Stumpy! What have I done to you!" Thus was Stumpy named. She threw the little tail out after him, half wondering if he would return after dark, like Peter Pan for his shadow, and stick it on again with soap. But before long it had disappeared from the terrace. Perhaps a robin spied it wriggling there, and flew away with it, taking it for a particularly tough angleworm.

It was sometime before she saw Stumpy again, and she had begun to fear that the accident had proved fatal, when one August day, as she sat on the terrace, she saw Stumpy coming along the path below, at the foot of the stone wall. By a series of runs and stops, he progressed to the foot of the stone steps. There, balancing himself on his stump and using it for a spring-board, he hopped up on the first step. Across the step, another hop up, and so on, until he arrived on the terrace and stopped near her feet, to rest and wait as of old, for a meal to come along. It was indeed Stumpy, quite well and hearty, and wonder of wonders!—wearing a quarter of an inch of brand new tail!

From then on until the autumn summoned all the cold-blooded creatures for their long sleep, the tail grew slowly but noticeably. In the following spring, it was an inch and a half or more in length. This new tail was blunt, not tapering and long like the first one, and somewhat darker in color, with no stripes on it, its scales smaller and smoother than formerly. Still, as a tail, it did very well.

So at last the woman understood that when Stumpy had snapped off his tail, and won his name, he had simply been putting to use the gift Mother Nature had given him, a detachable tail, useful in desperate emergencies! Other kinds of lizards, larger and stronger than his tribe, use their tails to deal lashing blows to an enemy, but Stumpy's tapering appendage doubtless served him best in that moment in his life when he parted from it, and made his escape—if one may say so—by the skin of his tail.

"HE COULD SIT AND SUN HIMSELF"

LEVEES FOR PROTECTION
or Protection for Levees?

by J. R. Simmons

The Congress of the United States is now in session and one of the problems which should come before it for serious consideration and definite action is that of flood control and relief. Interwoven with this question, which concerns a large percentage of the people of the United States and a large part of its territory, is that of reforestation to check the run-off of waters. Trees, according to many authorities, have an important bearing on flood prevention, and in this connection the publication of the American Tree Association, "Floods, Forests and the Future", has met with widespread use and appreciation. The accompanying article deals with a detail of flood control,—that of the strengthening of the levees. It shows the importance of tree planting in connection with solving one phase of the whole problem.

THIS is not a technical article, but the writer is reminded of the day when he first looked into a text book on plane surveying and read that "this subject pre-supposes a knowledge of trigonometry." Unless the reader is familiar with some of the outstanding features of the great Mississippi disaster of 1927 he will not be greatly impressed with a discussion on a selected phase of the problem of flood control. Few of us, however, who have been in our own country during the last several months have failed to pass up our trigonometry in the matter of floods.

"Levees for protection or protection for levees?" is by no means a catch-phrase title. It suggests the question whether, in resisting the forces of Nature along the lower reaches of our great rivers, we should continue the practice of heaping up mounds of earth, or whether those same mounds of earth should first be protected before they are required to serve along our southern sector of defense. This is like asking whether we shall have battleships for defense on the sea or armor plate for battleships.

A levee is efficient until overflowed or burst. An overflow cannot be prevented in time of a major flood, but a break is preventable. More emphatically a levee break is preventable, and *the prevention factor is trees.*

We do not mean that any sort of trees applied in a given way will waterproof a levee; nor that the standard type of reforestation applied right on the levee itself will serve that purpose. But let a man walk down a stream (his favorite trout stream will answer the purpose) and consult with the trees that are growing on the disputed ground which lies nearest to the main current. He will agree before long that there are very logical grounds for the above statement. He may, indeed, be convinced of its complete truth before he has gone a mile.

ROADWAY ON A TEN-FOOT LEVEE
The willow-lined thoroughfare, however, is planted under the old system of planting

There is a tree hitherto not extensively used outside the landscape field, and the field of charcoal manufacture, construction of wooden-legs and a few other industries. Yet it is one of the largest, most widely distributed and persistent of all our common trees. It is the white willow, *Salix alba.*

This tree has several relatives possessing similar family characteristics, and as we work outside the natural range of the *salix alba* other domestic willows can be found that are applicable to the same system of protection. The Carolina poplar also is useful in this connection.

The frequency with which one hears the story of a willow cane being stuck carelessly in the ground only to reward its benefactor a few years later by producing a wide-spreading tree causes us to marvel that we Americans have not long since taken advantage of this wonderful quality and saved ourselves many millions of tons of precious soil!

Within the last decade, however, there has been developed a system of revetment for sliding banks, sea, lake and river shores, dikes and levees and even blow sand,—based upon the use of willow. The results up to the present time have been fascinating to behold.

The system came into this country by way of Canada. It was so comparatively simple that it was not accorded any unusual reception during the first year or two. But it has gained ground remarkably and has at last begun to serve on one of the main tributaries of the Mississippi River. The initial construction in that area was undertaken recently along the Arkansas.

The name applied to the willow system of erosion prevention is Angular Submerged Tree Planting. Straight willow poles are placed in water-washed banks at a slope of about forty five degrees,

which is approximately the "angle of rest" for sand, gravel and earth structures in general. The lower end of the willow pole is sunk deep in the earth at the base of the bank where it secures the water necessary to its rapid growth.

Primarily, the results of the system are due to the fact that wherever there is a bud on the upper side of the willow pole there springs up a sprout, and similarly from the lower side there goes down a root. Thus, a live pole thirty-five feet in length is capable of producing the equivalent of more than one hundred seedlings and as many individual root systems.

A SELF-SUSTAINING DRAINAGE DITCH
So heavy is the overgrowth of willows that no weeds or brush will grow to check drainage

The growth is remarkably rapid, not over sixty days being required to cover an embankment with a sprout growth twelve to fifteen inches high. A single favorable season often produces sprouts as high as one's head. The system is ready for high pressure conditions after a very few years of growth. Roots from eight to sixteen feet and more in length have been traced outward and downward from the main pole at the third year.

Levees lined with living roots from top to bottom and protected at the surface on two sides with living willow trees may be submerged when Nature sends down the deluge, but they will not burst. They have become a living wall, bending at times under relentless pressure but not breaking asunder. And they possess the power of making their own repairs and growing stronger year by year.

Revetment with stone, sand bags, concrete and loose earth is a dead construction. It comes comparatively early to its periods of wear and repair, decay and dissolution, expense and disappointment. Revetment with live material is self supporting and progressively resistant.

The only strictly technical feature of submerged willow planting is the temporary protection applied at the base or "toe" of the bank. Where flowing water is to be dealt with this structure is imperative to prevent under-cuts while the poles are working their roots into the soil and subsoil. One of the best materials used for basal protection is faggots, usually in the form of bundles. Here again trees contribute the control factor.

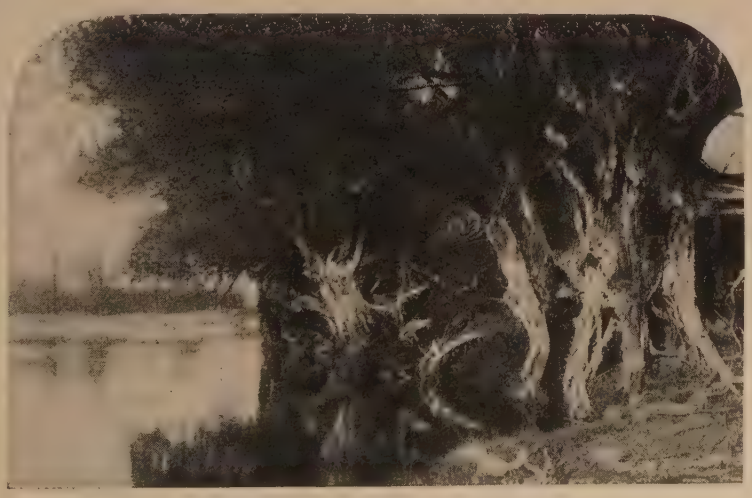
We are going to hear a great deal about flood conditions and flood control during the coming year. Many articles and discussions will be labelled "favorite schemes" and will be considered, reported on and dismissed.

The already wide application of submerged willow revetment planting,—on railroad embankments, lake shores, rivers, gravel banks and shifting sands, in Canada and in northeastern United States, should place this natural system of soil protection above the suspicion of propaganda.

Willow is not expensive, nor the system by which it is applied. An economic contribution toward the solution of an important national problem ought to be brought into the light of publicity and given its chance before the people.

Willow construction is competing successfully against rip-rap and concrete. It has commanded the respect and approval of engineers wherever it has been introduced as a major or supplementary or experimental construction. It has passed its inspections and been highly complimented in every case where the proper skill and technique have been engaged in its installation.

Quite naturally, those persons who have championed the cause of trees, individually and in the mass, are not going to be unduly surprised, but frankly gratified, if trees demonstrate once again that their usefulness in relation to the comfort and progress of man is apparently unlimited. The damage from floods along our waterways is so stupendous that its power to waste our resources and set at naught the results of vast cumulative effort is beyond calculation. The intelligent use of willow barriers will serve to stem much of this destruction.



ICE-SCARRED WILLOWS ALONG THE LEVEE
For fifty years they have protected the levee and been cut for wood in the meantime

**TO USE THIS MAP HOLD IT OVER THE HEAD—
TOP TOWARD NORTH**

It is designed for use January 1, 9 p. m.; January 15, 8 p. m., and January 31, 7 p. m.

JANUARY SKIES *and the* PLEIADES

by Isabel M. Lewis

DIRECTLY south of Perseus, which will be found in the zenith in the early evening hours of January, is one of the most widely known groups of stars in the heavens, the beautiful cluster of the Pleiades in the constellation of Taurus. Visible from every corner of the civilized world this group is even more generally known than our Big Dipper. Famed in story and legend in every land it has been honored by the savages of Polynesia, Australia and Africa, as well as by the most cultured races of ancient and modern times. It has aroused not only popular fancy but scientific study as well to an unusual degree. No group of stars in the sky has received more attention from astronomers than the Pleiades.

The ancients saw in these stars the Seven Sisters, daughters of Atlas and Pleione and half-sisters of the Hyades, another group nearly as famous in the same constellation. The Hyades, in the form of a V and containing the brilliant, red Aldebaran, a star of first magnitude, outline the forehead of Taurus, The Bull, while the Pleiades are clustered, as Bayard Taylor has expressed it, "like a swarm of golden bees upon his mane." To the average eye six stars are visible in the cluster in the form of a small dipper and the group is sometimes incorrectly spoken of as the Little Dipper. These stars are, by name, Atlas, Alcyone, Merope, Electra, Maia and Taygeta. Particularly keen eyes have seen in addition Asterope which is a double star appearing to the naked eye as a single star; Celaeno, Pleione, close to Atlas at the end of the handle of the little dipper, and one or two additional stars. A student of Kepler before the invention of the telescope claimed to have seen fourteen stars in the group and accurately mapped eleven of them. In the clear air of mountains and plateaus,

especially in the tropics, nine or eleven stars are frequently seen with the naked eye. A fairly good field glass, magnifying seven times, will show nearly sixty stars in the cluster; a three-inch telescope about one hundred.

Astronomers have identified two hundred and fifty stars as actual members of this group all sharing in a common motion and drifting through space in the same direction, showing that they probably had a common origin. It has been estimated that, all told, there must be between four and five hundred stars in the Pleiades cluster. All of the brighter Pleiades, about thirty in number, are far more brilliant and hotter bodies than our own sun, and the heavens as seen from a planet encircling one of these stars would be of unimaginable splendor with half a hundred or more stars shining more brilliantly than our brightest planets, Venus and Jupiter. This great assemblage of suns has a diameter of about forty light years, which is nearly ten times the distance from the earth to the nearest star in the heavens, or two and a half million times the distance from the earth to the sun while the distance of the Pleiades from the earth is ten times as great, or about four hundred light years.

A FASCINATING STAR CLUSTER
The Pleiades form one of the most widely-known and beautiful groups

One of the most remarkable facts about the Pleiades is that the principal stars of the group are enwrapped in a vast nebula which is most noticeable in the vicinity of the brighter stars, particularly Merope and Maia, and in fact this nebula seems to owe its light, in part at least, to the illumination it receives from these stars. It is possible that the legend of a lost Pleiad, of seven stars visible to the naked eye where now there are but six, which persisted for so many years in many lands, may have had some foundation in fact. It is suspected that the light of some one of these stars may have fluctuated very greatly at some time in the past, due to its connection with this nebula, and that it may have been for a time visible to the naked eye and then later faded from view.

As the Pleiades lie in the zodiac and therefore in the path of the moon it often happens that stars in this group are temporarily "occulted" or hidden from view by the moon. This is always an interesting sight to behold. Also when the moon is among the Pleiades it is possible to understand how we unconsciously exaggerate the size of the moon. The diameter of the moon is about half a degree and this is less than the distance from Alcyone to Electra or from Merope to Maia so that the full moon would not quite fill the space outlined by the bowl of the dipper in the Pleiades! This hardly seems believable so greatly do we overestimate the angular dimensions of our satellite. One must actually see the moon projected against this background of stars to realize how small an angle it subtends in the sky.

The brightest star in the Pleiades group is the third-magnitude star Alcyone at the juncture of the handle with the bowl of the dipper. One cannot pass this star by without reference to the important position that has at times been given to it in popular fancy as the center of the universe. Even certain astronomers of the past yielded to the spell and, without any foundation in fact, considered this star to hold a central position in the universe of stars as our own sun does in the solar system. It is now known that there is no reason whatever to hold any such belief. Alcyone is but the brightest member of a beautiful cluster of suns journeying onward together through the immensity of space.

There are many beautiful constellations and stars to attract our attention in the January evening skies in addition to the Pleiades. At no time of the year are the heavens more brilliant with stars of exceptional splendor than in winter. This month we have Orion, finest of all the constellations, conspicuously in view in the southeast with Lepus, The Hare, crouching beneath his feet and his two dogs, Canis Minor and Canis Major, marked respectively by the two Dog-Stars, Sirius and Procyon, following at his heels as he marches across the heavens facing The Bull with uplifted club. To the north of Orion is Auriga, The Charioteer, carrying in his arm Capella, The Goat, with the Kids. To the northeast are The Twins, Castor and Pollux, in Gemini. Westward and southward from Orion flows the river Eridanus to the southern horizon and in the western sky we may still see Andromeda and the Great Square in Pegasus. Perseus, as we have said, is now in the zenith and Cassiopeia and Cepheus, The Royal Pair, may be seen high in the northwestern sky in the path of the Milky Way which now extends diagonally across the heavens from the northwest, through Perseus overhead, and Auriga high in the east, past the feet of Gemini and between Canis Major and Canis Minor to the eastern horizon. The Big Dipper in Ursa Major is still far over in the northeast but is now swinging upward toward the meridian in a better position for observation.

Jupiter is still the only planet visible in the evening sky and will be found far over in the west in Pisces. Venus and Saturn are visible in the east before sunrise. Mars passes from Scorpio into Sagittarius this month and will be found to the southeast of Venus. Mercury will not be in a favorable position for observation as it is on the far side of its orbit from the earth.

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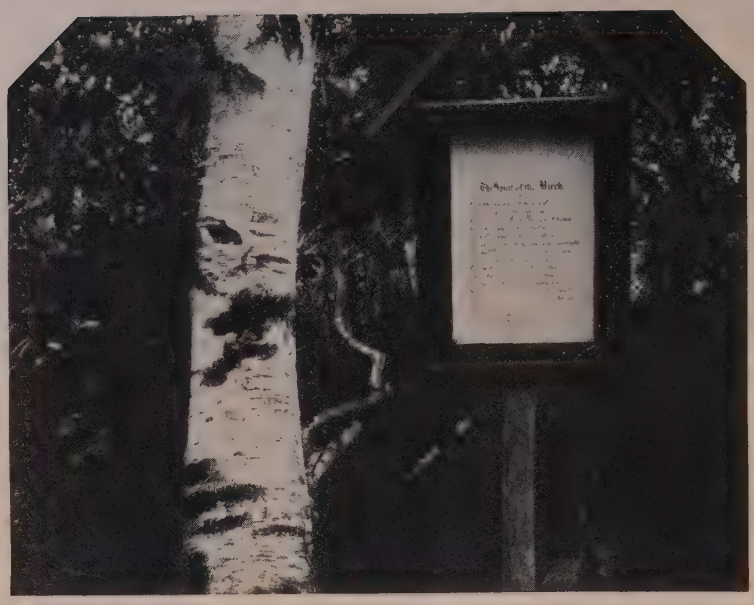


At camp Medomak the white birch shown in the illustration was selected to portray the thought of protecting this lovely tree from the thoughtless vandal. The poem shown in the picture is reproduced on the right of the illustration

THE SPIRIT OF THE BIRCH

I am the dancer of the wood
I shimmer in the solitude;
Men call me Birch Tree, yet I know
In other days it was not so.
I am a Dryad, thin and white
Who danced too long one summer night,
And the Dawn found and prisoned me!

FORESTRY *in Summer Camps*

What the American Nature Association's Special Visitor Found

by William G. Vinal

Acting on its conviction that Nature study is the fundamental key to good camping and a vital factor in conserving forests and wild life, the American Nature Association inaugurated a special Nature service for camps. Dr. and Mrs. William Gould Vinal—"Mother V" and "Cap'n Bill", as they are known in camp circles,—were retained to visit forty-seven camps, giving advice and assistance along Nature lore lines. The camp directors were informed of this service and the list of camps to be visited was quickly made up. The trip covered New England and eastern New York, and a trail 3209 miles long. The tour was a friendly visit for inspiration and in no sense an inspection. The camp directors were unanimously pleased with the service and much comparative information was obtained. This article is the first in a series based upon the camp tour. It deals with forestry because that is a question that it is well to think of right now for future guidance.

It is well recognized that one of the most important factors in meeting the inevitable forestry problem of the future is educating the rising generation to the fundamentals of the question. The schools, Boy Scouts, Girl Scouts, Campfire Girls and other organizations are doing their part in this direction to a varying degree. The summer camp, however, has a greater opportunity than perhaps any other agency concerned with the young mind both to practice and preach forestry.

Without the forest what would the camp do for camping, for hikes, for woodcraft and for fishing? In fact, what kind of a camp would it be without a forest? Yet most camp directors do not practice forestry,—or preach it. There lies before them an opportunity, —in truth, a responsibility,—to aid in the campaign of forestry education. If they consider the welfare of their campers when they grow to men and women, a camp program that will make for forestry-mindedness is a duty. The materials for such a program are ready at hand and the employment of these materials not only serves a useful purpose but provides an entertaining feature that will round out camp life.

About twenty per cent of the camps visited have undertaken reforestation work, usually with plantings of white or red pine. In not more than two per cent, however, has this planting been carried on with the assistance of the campers themselves. This may be due in considerable measure to that fact that a large-scale spring planting takes place before May 15 and well before camp opens, or that a fall planting cannot generally be started until after camp closes. It does not, however, seem generally to be realized that trees may be planted successfully during the summer if it is properly done. Planting a large number of young evergreens before the last of August would not, of course, be wise, but every camper should be given the fun of planting and caring for at least one tree. It will become a perennial source of pleasure when the camper returns to camp or as a grown-up visitor.

Even though the actual reforestation work may not feasibly be done during the camping season, at least a seed-bed can be started and cared for. In many states seedlings of

from one to four years growth may be obtained from the State Foresters at nominal cost. More camps should investigate the possibilities of such co-operation and should undertake reforestation work on their property. It is an investment in the future.

Virtually no systematic protection from forest fire, insects and disease was discovered in the camps visited. Apparently none knew of the possibility of insuring the woodlands. Yet it hardly seems necessary to tell camp directors that a forest fire would quickly roast the goose that lays the golden egg of camping. A few hours and a fire would make the camp look like a deserted lumber town or a mining camp with the vein "paid out." State foresters will be glad to advise on a fire protection plan and there is value in having the campers feel that the protection of the forest that gives them shelter is in their hands.

Insects, also, account for many forest trees, and one instance was noted where the trees were stripped of leaves by brown-tail caterpillars. The campers were affected by the ubiquitous hairs of these insects, causing the brown-tail itch and making it necessary to close camp. So fire lines and insect prevention should be considered by every camp director who takes the trouble to look ahead.

One of the simplest details of fire prevention lies in cleaning up the woodlot to reduce the fire hazard. Let every camper have a hand in this with a plot of his own to care for. Let him cut out all the dead trees and the weed trees such as cherry, hornbeam and gray birch, leaving enough partially to shade the pines. If these last are not present they might well be planted. The waste brush should be piled and burned in a place and at a time when there is no danger from fire. A trail, or a system of trails, can be made to serve the dual purpose of trail and fire line.

Various sources will supply free information to camp directors and campers on forestry and its practices. The State Forestry Commission, the State College and the United States Forest Service can always be appealed to. The American Tree Association, Washington, D. C., will send copies of its *Forestry Primer* and its *Tree Planting Book*, as well as other material, on request.

There are many young men at the various forestry colleges equipped to direct a forestry program at camp. This past summer the Society for the Protection of New Hampshire Forests sent out Mr. William Harlow of the New York State College of Forestry to advise and demonstrate in camp forestry. The reception of this service by camp directors was enthusiastic and its result should be far-reaching. The work should, however, be followed up from the Nature lore point of view and not from the technical forestry standpoint. Summer camps should have a forestry program led by a man who can make good with the campers.

When it is realized that of the forty-seven camps visited each have, on an average, nearly 200 acres of land, mostly forested, the importance of forestry is obvious. But when it is further realized that less than four per cent have fire lines, tree nurseries, trails or cleaning out programs, it is disturbing and indicates what there is to be done. Let the wise camp directors consider this question.

The late Charles W. Eliot once declared that the summer camp is "the most important step in education that America has given to the world." Colonel William B. Greeley, Chief Forester of the United States, in his official statements, and Mr. Charles Lathrop Pack, President of the American Tree Association, in his nation-wide education work in forestry, are among those who have emphasized the vital importance of education in connection with the forestry question, present and future. If, then, the summer camp is to fulfill the promise as an educational force attributed to it by one of our greatest educators, it must needs seize the opportunities pointed out for it by our leaders in forestry activity.

That intelligently directed Nature lore work is appreciated by camp directors and unceasingly emphasized in camp activities, was discovered by Dr. Vinal. The following statements by camp directors express the thought:

"A wilderness playground . . . gives opportunity for the development of a real love for the woods. Our boys see the deer, squirrels, chipmunks, grouse, muskrats, rabbits, bees and other creatures who live about us and they are encouraged to give reports of what they see in the council ring". UNCAS.

"Memories of our Nature lore are among the most precious that we take away from camp". RAGGED MOUNTAIN.

"We specially aim to arouse the interest of the boys in the various branches of Natural History". CHEWONKI.

"We stand for the love of Nature. It is a part of the camper's creed 'to face the world strengthened by the lessons of the Great Outdoors' ". WYONEGONIC.

"One of the most valuable opportunities of the summer is the chance for the cultivation of a love of Nature". ANAWAN.

"All art, all education, can merely be a supplement to Nature. Nature study is a fundamental educational process because it begins with the concrete and simple; promotes the power of observation; relates the boy to his environment, and develops sympathy for the common and near at hand. Nature study presents living problems and a challenge to learn by observing". INDIAN ACRES.

That Nature Magazine is an important factor in camp activities and of notable use to campers was amply proved by Dr. Vinal during his tour. He discovered that in every one of the forty-seven camps visited there were campers from families that receive Nature Magazine. In Camp Hanoun, for example, 68 out of the 131 campers were from Nature Magazine families; at Aloha Hive, 53 out of 120; Mowglis, 44 out of 88; Lanakila, 36 out of 72. With one or two exceptions Nature Magazine was to be found—its condition testifying to much use,—on the camp reading table. Many camps had the colored pictures painted by our artist, R. Bruce Horsfall, posted in their libraries. Dr. Vinal, in fact, came to the definite conclusion that "the number of Nature Magazine campers is a good thermometer of the quality of the camp". These figures and reactions are cited to show the educational service that the American Nature Association and its magazine are performing.

HINTS AND HELPS
FOR
HOME and GARDEN

JANUARY
by
Thomas Sheward

In the northern states very little can be done in the garden this month, except pruning. Hotbed sash should be repaired now, if there is any broken glass, so that it will be ready for use next month. Good garden frames can be made from old second-hand window sashes, and will be useful for starting plants next month.

* * *

In the south, and on the Pacific slope, hotbeds can be made up this month, for very early flowers and vegetables; trees and shrubs can be pruned; and any vacant ground should be dug, ready for planting in February.

* * *

Bulbs will now be flowering in the window garden. There are many interesting ways of growing these, other than in pots, and a very pretty effect can be made for table decoration with a floating bulb garden. A large bowl is necessary, as illustrated, and a large piece of cork bark which can be purchased at the florist store. The cork is cut as shown in the diagram, and holes made through it with a sharp knife or auger, just large enough for the bulbs to fit into and touch the water. For large bowls narcissus and roman hyacinths can be used, and for small bowls, scilla, crocus, snowdrop, and muscari "heavenly blue". The bulbs are started in a dark place for about two weeks, till the roots grow into the water, then they are taken into the living room for flowering. As soon as the bulbs begin to grow, grass seed is sown on the cork, and when the bulbs come into flower, a very pretty effect is secured. Another way, when it is possible to secure the moss, is to cover the bark with *Arenaria montana,* or "spargula moss" which is used for planting paved walks.

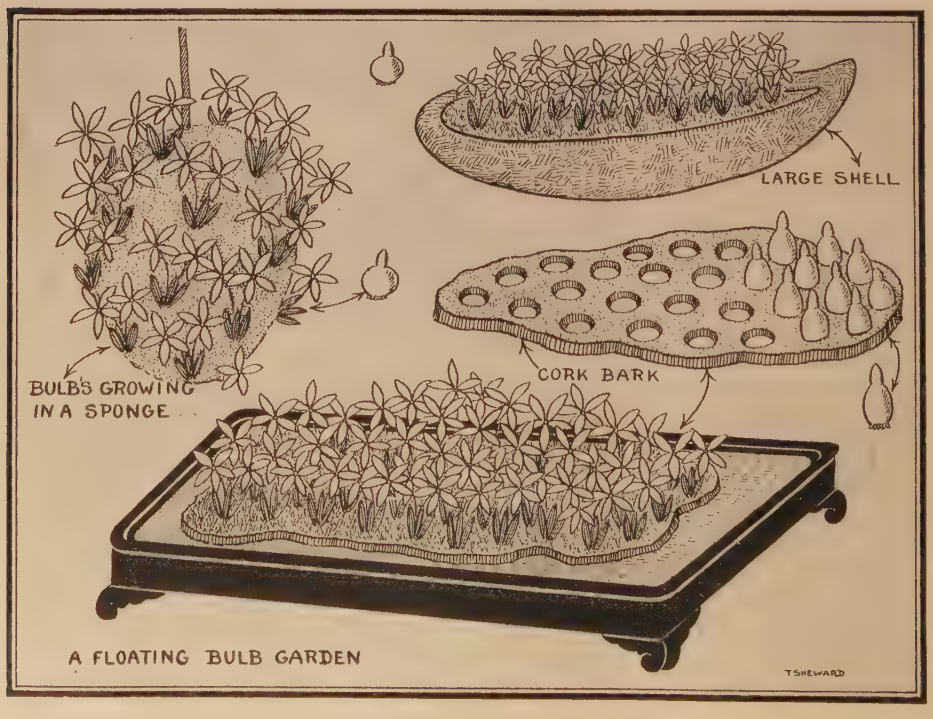
WE wish to make this department of real use to our readers and will appreciate any hints and helps that they wish to pass along to a fellow reader. Haven't you some discovery or development that would be interesting and helpful to others interested in Home and Garden? Send it to the HINTS AND HELPS *Editor*

* * *

Another interesting way to grow bulbs indoors during the winter, is to secure a large sponge, fill the holes with small bulbs, such as muscari, scillas, snowdrops, or crocus and then loop a piece of thin wire around it so that it can be suspended. Green moss is tied to the sponge with thin twine, or grass seed can be sown when the bulbs begin to grow. Dip the sponge in water and suspend it in a dark place for a few weeks until the bulbs begin to grow, then take it into a warm room for flowering. Roman hyacinths and other large bulbs can be planted in sponge by enlarging the holes.

* * *

Large sea shells are often used for growing bulbs, and are filled with fiber instead of soil so that drainage is not necessary. Very pretty effects can be made by growing bulbs in pots of mossy saxifrages, crocus and muscari being very good for this purpose, as they do not make much foliage when forced.



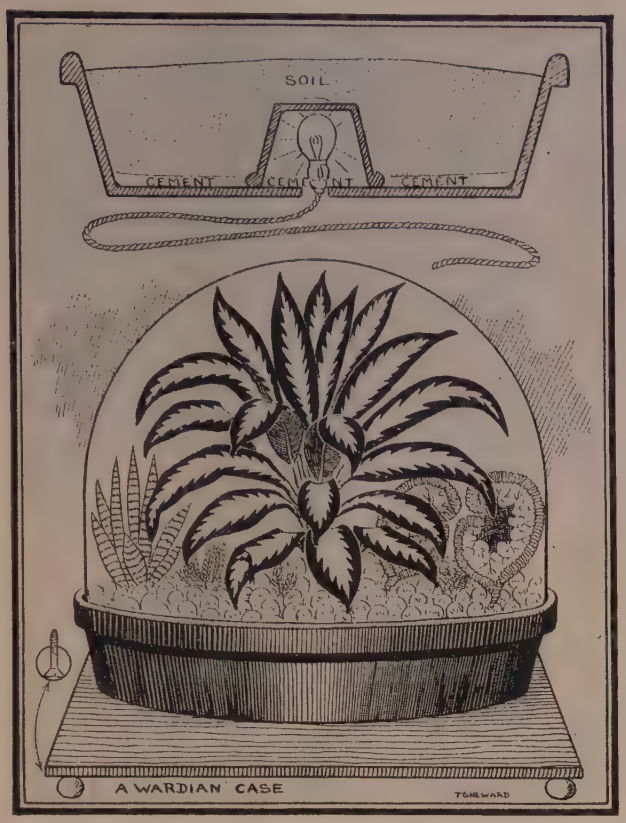
* * *

A very interesting feature of room gardening at this time is the Wardian Case. The Wardian Case is used for growing tender tropical ferns, mosses, crotons, dracaenas, pitcher plants, and such in the living room under conditions where they will be free from draught and dust. The Wardian Case is air tight and supplies its own atmosphere by evaporation, so that watering is not necessary. When planted with beautiful foliage plants, the Wardian Case is very interesting, espec-

ially during the winter.

* * *

The Wardian Case illustrated can be made at home with a large twelve-inch seed pan, and a glass cloch, or bell glass. It is not necessary to supply heat, but better effects can be secured if the soil is warmed sometimes. An electric light bulb is placed in the pan, and cemented into the drainage hole. A four-inch pot covers this, and is also cemented firmly in place. The pan is filled with peat, planted, watered, and covered with the bell glass. Good foliage plants for filling the case would be Dracaena Goldiana, or crotons, with tropical ferns and selaginella, or peacock moss, for a ground planting. All these can be bought at the florist store. After planting, very little attention is necessary, for the Wardian Case is like a small greenhouse, and the heat can be turned on for a short time each day during the winter to keep the soil warm, and the plants in healthy condition.



* * *

When the Christmas tree is taken outside it can be used to attract the birds if suet and pieces of bread are tied to the branches.

* * *

If mice are a nuisance in the house sprinkle cayenne pepper near the holes, or gum camphor.

* * *

Moths can be kept away by sprinkling liquid camphor under the carpets, turpentine in the corners of the wardrobe or by the use of several good formulas on the market now. Tobacco dust, such as used by florists is also good for moths, or split cedar cigar boxes packed with clothes will keep them away. Dry branches of arbor vitae, cedar, and most conifers, will keep moths from clothes and black pepper will keep them out of furs.

* * *

To get most wear from a broom, dip it in hot soapy water every few days. This will make it more pliable, and it will last much longer.

* * *

When tulips, narcissus and other bulbs are used as cut flowers in the house, they will keep fresh much longer if the cut ends are dipped in boiling water. Another way is to dissolve charcoal and camphor in the water.

* * *

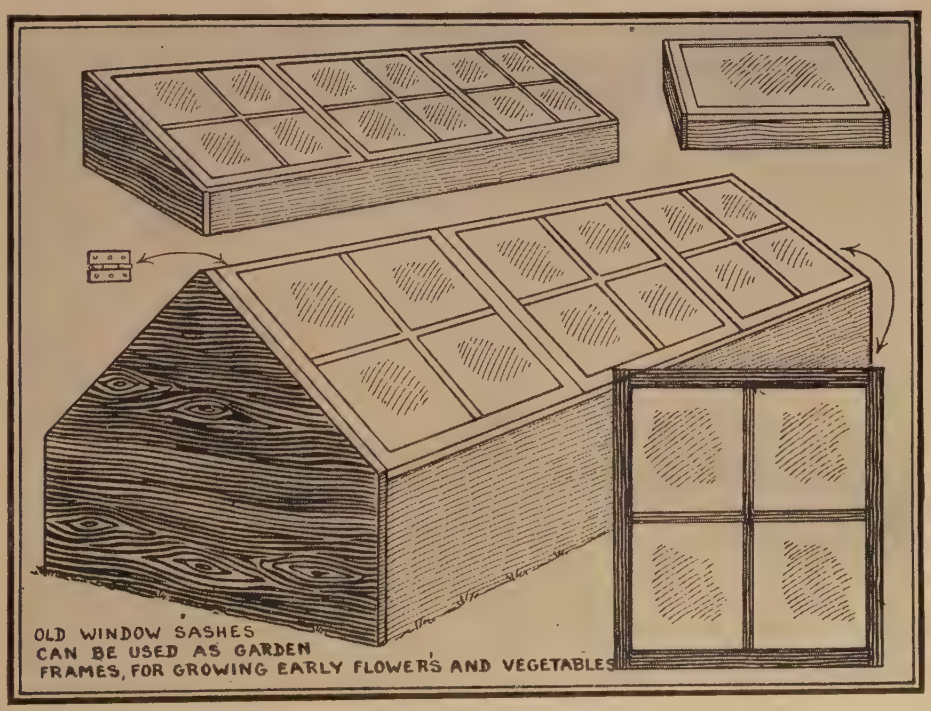
When the chimney catches fire, it can be stopped by closing doors and windows, and if an open fireplace, by holding a wet blanket in front to stop the draught.

* * *

A piece of lettuce or apple will be appreciated by the canary once or twice a week.

* * *

Are your palms spotted with scales? If so, wash the fronds with whale oil soap. At the same time sponge the leaves of all house plants to remove accumulated dust and help them to breathe. Indoor plants need more moisture in the air than is supplied by the ordinary heated house. To make up for this lack, spray the leaves with water every bright day, and place a pan of water near the radiator or register that the evaporation may make the room healthier for both plant and man. In watering do not make the mistake of merely sprinkling the soil. Water thoroughly until the earth is soaked to the very bottom and the water running out, then leave it alone until the top soil is dried out.



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Some Suggestions for New Year's Nature Resolutions

by E. Laurence Palmer

For the benefit of those who have the habit of making New Year's resolutions the following suggestions are offered for consideration. There is little probability that they will all appeal to all readers of this page but if but a few of them are acceptable and are put into practice by many it is believed that their publication will have been justified.

Resolved that at some time during the year I will plant at least one tree in such a manner and place that it may in all probability grow to maturity as evidence of my interest in the future prosperity of my community, my appreciation of the part played by trees in the beauty of the landscape and my unselfish desire to do a good turn.

Resolved that I shall lend my influence towards the effort to do all that I can to protect forests, wild lands and the life that they support from the ravages of fire. I shall make a practice of building fires only where safe and when necessary, never building them against a useful living tree and always being certain that they are completely extinguished before they are abandoned.

Resolved that I shall lend my influence towards the preservation of the natural beauties of roadsides and public grounds, doing what I can to prevent the erection of billboards which compel tourists to see what they do not wish to see in preference to seeing what they wish to see; that I will keep all camp sites I occupy neat and clean and free from refuse which may make the site unpleasant or unhealthy for other Nature lovers who might visit it.

Resolved that whenever I visit a spring which may have become unnecessarily contaminated, I will do what I can to make it useful to others who may visit it later.

Resolved that where the opportunity offers itself I shall ally myself with organizations and persons identified with applying the Golden Rule to dumb animals both domestic and wild and that where the need exists, but the above mentioned opportunity does not, I will myself assume leadership in this worthy activity.

Resolved that I shall never use a steel trap or any other inhumane device for capturing wild mammals or birds except in campaigns for the riddance of pests and then only where the traps will be visited frequently by myself or some other person to release those captured.

Resolved that I shall be neither ashamed nor afraid to say to a child that I do not know the answer to every question asked and that I shall do all I can to encourage rather than discourage the tendency which children have to ask questions. The saying that a dead man tells no tales might with greater fidelity to the truth be changed to, "a dead man asks no questions."

Resolved that during the year I will not play up the attractiveness of printed matter to children to the end that they will be deprived of the greater and more genuine experiences to be gained from learning at least one thing a week directly from natural objects, if possible in a natural setting and without any outside help of an informational nature.

Resolved that I will recognize the value of printed matter in Nature work not as an end in itself but as a means of opening up new opportunities for profitable experience and as of value in offering guidance in making those experiences more worth while than they might otherwise be.

Resolved that during the year I shall do my best to deserve the distinction of being essentially an animal blessed with the ability to reason and accordingly that my treatment of such creatures as cats, bats, snakes, hawks, owls and others will be determined by the proven records of service or destruction possessed by these animals.

Resolved that I will recognize the debt of gratitude we owe to the scientific method for increasing our economic prosperity, in securing information helpful to us in administering moral justices and in increasing our confidence that as time goes on Nature will be increasingly generous to mankind.

Resolved that I shall recognize that life without some fun in it is unnatural both for man and beast and that when I measure the success of my own work in preparing children for life, the presence of fun in my practices will be one of the units in the measuring stick.

Resolved that I shall do what I can to help keep the accomplishments of Nature Education before influential groups of people, that I shall try to prepare myself to present these facts properly to such bodies as the juvenile organizations, the parent-teacher groups, teachers meetings and clubs of various types.

(*Continued on page 67*)

An Owl of the Solitudes

by William E. Sherwood

Photographs by the Author

LIKE A WISE PROFESSOR
(Below) Note the baby tanager perched on baby's foot

ON A LIMB OUT OF REACH
(Below) A trio of infants discuss the question of photography

Just a mass of down and feathers,—such was his first appearance when brought to me by a neighbor, who had found him seated on a fallen log among the pines, oaks and spruces of the extensive forest which covers the mountains of southern Oregon.

This baby spotted owl—for such he proved to be—was lively for such a seemingly insignificant bundle. He assumed a very pugilistic attitude when I approached too closely. With beak partly open, wings half spread, and wide-open eyes glaring defiance, he leaned back on his heels and thrust up his small talons ready to grab anything that might come within reach. All this time he snapped his bill angrily, which means, in owl language, "Keep away from me! I'm dangerous!" This aggressiveness is a perfectly justifiable trait which nearly all birds have acquired toward mankind. Within a few hours, however, this attitude of enmity gave way to tolerance as he lost his fear.

Some time before sunrise the next morning I heard a very soft, plaintive, quavering call, similar to that of a tiny kitten. From far across the canyon came back the hooting of an old owl. I listened to them. Invariably the plaintive note of the baby owl followed the mature call from the forest. Each time the old owl hooted, my pet answered as best he could, not realizing the futility of making himself heard at such a distance. Did he recognize the voice of one of his parents? Or was it simply an instinctive effort to get in touch with his own kind?

A few moments later he managed to scramble up out of his box and was gone for some time before he was missed. I searched thoroughly but fruitlessly in the immediate neighborhood, till put on the right track by a welcome clue from an entirely unexpected source.

Some distance up the hillside the robins were making a regular bedlam of chattering and scolding. Following these sounds, I came upon my owl making for the tall timber, a foot at a bound, as fast as his weak legs and stubby wings would carry him. The angry robins darted straight at his head, then swerved so as barely to miss him. Sometimes one of them actually hit him a glancing blow, but, well padded with feathers, I doubt if he suffered from these attacks. The noisy fuss of his tormentors continued, aided by any stragglers, such as blue-fronted jays and an occasional junco or western tanager. For the moment, it looked as if the only idea of the little owl was to get away from these pesterers. When he saw me, he stopped, waited, and calmly submitted to being picked up, as though his red-breasted foes had made him repent running away.

In the meantime, a western house wren was building a nest in a wren house not ten feet away, and apparently the owl did not exist as far as she was concerned, for her incessant singing and nest building activities went on uninterrupted.

It was now necessary to face the problem of making a temporary pen for the young guest. This was accom-

Burpee's Seeds Grow

Luther Burbank wrote:

"I have had the pleasure of sending many hundred customers to you for seeds during the past few years, as I always refer anyone asking for seeds to your firm, as personally I consider your house the most reliable retail house in the world, and I think that would be the verdict of the public at large."

Two rows of Burpee's Branching Sweet Corn stripped of husk and foliage to show the ears. Note the even height of the plants, 6½ feet tall, and their enormous yield.

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mellow tints of silvery lavender . . .
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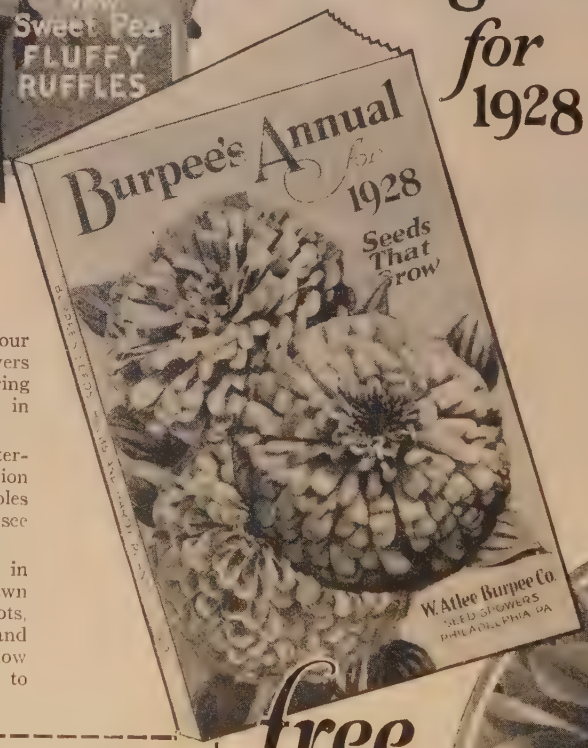

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olished by fastening small willow sticks for bars through he front of a strawberry box. Though supposedly placed lose enough to each other, it was only a matter of a few moments until my owl had managed to squeeze out etween them, proving that as far as dimensions are concerned, by far the greatest part of an owl is feathers. I immediately doubled the number of bars, but this time he worked and tugged with his beak till he got three of them out of his way, and was gone again. He made many similar escapes from time to time, but these did not prove serious because before going far he usually took up quarters on some fence or other convenient perch, and waited for me to find him. It seemed as though no pen would hold him, and it was this aptitude for getting out of impossible places that earned for him the name of "Houdini."

He was soon tame enough to be allowed outside of his pen until toward evening when he naturally became active and restless. His daytime was just beginning. During the heat of the day he perched on a shady limb for hours at a time, scarcely changing his position even when bothered by robins.

SURVEYING THE SITUATION
He would take up quarters on some convenient fence and ponder

As soon as he began acquiring the use of his wings, it became necessary to confine him, except for such occasions as feeding time, and journeys into the woods to pose for his picture. Often he took undue advantage of such opportunities and suddenly flew away for a short distance, usually alighting on or near the ground, though sometimes he attained a limb out of reach. It was then necessary to dislodge him with a pole or little missile, or climb up after him. Usually when returning from such excursions he flew from my hand straight into the door of his pen. After several weeks of alternate monotony and adventure, he reached his maturity.

The spotted owl, *Strix occidentalis,* is the western representative of the eastern barred owl, and is considered quite rare. He inhabits the deep solitudes of the far western forests from British Columbia to Mexico with the southern part of his range extending eastward into New Mexico and Colorado. As many as four subspecies have been recognized, but the differences characterizing these races are rather slight. As this bird hides himself in the backwoods country away from the haunts of mankind, very little is known of his habits.

Often in the dead of night I have heard the "booming" of these owls as they called and answered each other among the tall pines. The loud and weird "thump; thump - thump - thump - thump; thump" would be answered by a somewhat similar series of hoots as the birds expended their surplus energy flying from tree to tree, or lurching out into space from a topmost branch, describing a perfect circle against the moonlit sky, then flaring back to a perch again. Thus they worked their way along through the forest till the sounds died away in the distance.

About half the food of this species consists of mice, the remainder being made up mostly of frogs, lizards, crayfish, spiders, insects, and an occasional small bird or domestic fowl. While they might be held slightly accountable for the last two mentioned articles of diet, yet these owls are so rare as to be practically of no economic importance.

Having been raised as a household pet along with the baby and a spotted fawn, the owl lived up to his privileges as a real member of the family. He was now gentle and tractable, and loved companionship. In fact, if he was left alone too long at a time, he called softly and continuously until some member of the family came to pet him or feed him a bit of something he liked. He sat quietly while his head was stroked, or nibbled a finger in a friendly manner; or he even ate a bite of fresh meat in the day time, which is the middle of his sleepy time when he is not hungry. He wished to be obliging and sociable. And he loved to be taken from his perch onto a finger and carried around for a walk. All the time he uttered soft croonings as if pleased and contented. Houdini's magic was in him, a magic of understanding.

NATURE NEWS AND Views

Rare Consideration

Normally the great smokestack of the Anaconda Copper Company at Great Falls, Montana, is illuminated by flood lights and visible for miles around. During the fall migration of birds, however, the lights were put out because it was found that the birds were lured by the illuminated stack and dashed themselves to death against it. A fine consideration on the part of the officials concerned, and a rare one!

A Friendly Gull

Buffeted by the winds and badly injured, the gull was picked up on the beach at Bay Head, N. J., by the family of Katherine B. Williamson of Philadelphia. He was christened "Silverwing" and fed and nursed back to strength. Appreciative and friendly, the gull won back his health, but one day on the bay a flock of his fellows joined him, and when they left he went with them, flashing a thankful wing in the distance.

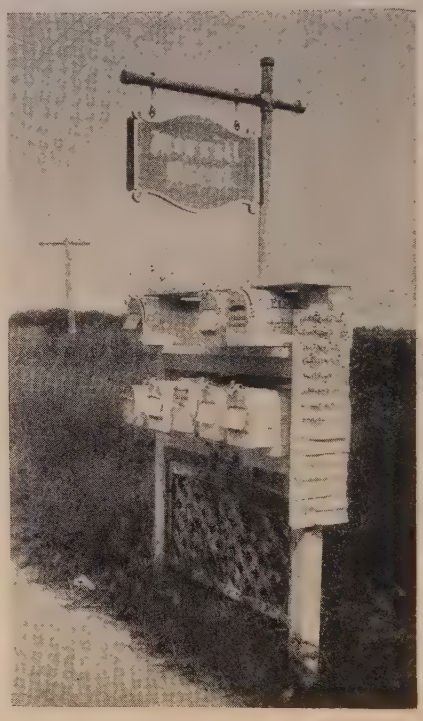
"SILVERWING"

Florida Bird Refuge

A group of marsh islands in the Matanzas River south of St. Augustine, Florida, has been transferred from the jurisdiction of the War Department to that of the United States Biological Survey to serve as a bird sanctuary. These islands are the nesting place of wild fowl, though chiefly terns and shearwaters nest in the vicinity.

Here is a Thought

The R. F. D. box is not always a decoration along the roadside. In fact it is usually the contrary, but Mrs. W. L. Lawton of the Committee for the Restriction of Outdoor Advertising sends us this picture of a group of these mail boxes attractively arranged. This may be a detail of the general work of roadside beautification but it is one that certainly deserves a little thought such as Merrill Crest gave to it.



Webfooted Dogs Score

Easily the outstanding sensation of the recent Kennel Club show in London were two Abyssinian Sand Terriers, who are described as looking like enormous rats. They have webbed feet enabling them to make their way across desert sands and their bodies are hairless. The dogs jumped out of a crate of pythons received in England, having travelled that way and escaped being eaten because of the torpidity of the reptiles.

Essay Contest Winners

Announcement in NATURE MAGAZINE of the Trees and Wild Flower essay contest conducted by the Horticultural Society of New York brought entries from twelve states and from three children in Switzerland. The winners were Lois Wilson, Fort Pierce, Florida, and K. Kathleen Kellogg of Alvin, Texas. Virginia Jarrett of Salt Lake City, Utah, won a ribbon for commendable effort.

Dinosaur Playthings

Philip H. Pope of the U. S. Veterans' Hospital, Walla Walla, Washington, sends in the picture of some original toys he fashioned with jig-saw and jack-knife for his daughter, Edith. They are dinosaurs, the models of which were the articles by C. W. Gilmore in Nature Magazine. Mr. Pope says that he is going to try his hand at Triceratops next.

Nature Trips Popular

Testimony to the popularity of the Nature Guide service available in several of our National Parks is available from many sources, and the experience in the Yosemite National Park this summer is indicative of this fact. H. C. Bryant reports that with a force of eight Nature Guides it was frequently difficult to handle the crowds and it was not exceptional for 125 people to show up at Camp Curry for a Nature field trip.

All About Caves

Some of the most remarkable cave material, particularly photographically, has been gathered by Russell T. Neville, Kewanee, Illinois, lawyer, and worked into a remarkably interesting lecture. Mr. Neville has made cave exploration a hobby, having penetrated some eighty caves and taken pictures in about sixty-five. Some remarkable still pictures have resulted but this last summer Mr. Neville and his party went exploring again, this time with a motion picture camera. By the use of flares and by overcoming tremendous difficulties he has acquired about 2300 feet of motion picture film in caves, using this and his adventures in a fascinating lecture given to a limited extent. Organizations located in the vicinity of Mr. Neville's home can obtain details of his lecture by addressing him at Kewanee.

Bermuda's Scenery

Bermuda's officials apparently appreciate the beauty of their island sufficiently to solve the billboard problem in no uncertain terms, judging from an article by W. H. Chamberlain in the November, 1927, issue of *The American Magazine of Art*. The writer says that there have been and still are sporadic attempts to legalize billboards on the island but that they always fail in the face of a stringent law passed in 1911 that regulated billboards by prohibiting them without reservation. The returns are obvious in the expressions of delight on the part of visitors and public sentiment holds sway. This magazine, incidentally, is actively urging billboard restriction, and the American Federation of Arts, which publishes it, is dedicated to the cause of improving the appearance of our out-of-doors.

Japan Checks Birds

Bird-banding practices employed in the United States and Canada have been adopted in Japan in connection with study that is being made under the auspices of the Japanese Government of bird migration habits. This movement is designed to provide the basis of better protective regulations. Each band is numbered and has the ideographs NO RIN SHO on it, signifying that bands found should be sent to the Ministry of Agriculture and Forestry at Tokio.

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We offer you English grown seeds of the highest quality, our own importations, with the assurance that they will fulfill your expectations of growth and loveliness.

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Star-Gazers Note

Members of the American Nature Association visiting Miami, Florida, this winter are invited to be the guests of the Southern Cross Observatory. This astronomical group has six telescopes, 5-inch Clark refractors, and numbers about thirty star-lovers who meet on a hill in Bayfront Park. Every evening from January 1 to April 1, when the weather permits, which is almost always, the society opens its glasses to the public. For the attendance at the telescopes, fifteen-minute lectures with stereopticon, school and organization work and general good times, the thirty are far too few and a few hundred more are welcome. At times last winter a thousand visitors were entertained in one evening and on such occasions the informed assistants find plenty to do. Winter at the south end of Florida finds Canopus, Achernar, the Southern Cross, the great stars in Centaur and far southern clusters in view and these are worth the visit. Write the secretary, James J. Marshall, 807 Biscayne Bank Building, Miami, or drop in on him.

Beno Went to War

Beno was his name and his master, the Major, was ordered to France on an inspection tour. Beno was assigned to the Marines at Quantico. Soon, however, the order to the front came and the ruling was that pets were not to be taken aboard ship. Being a Marine, Beno knew how to look out for Number One, and when the men were marching from the train to the transport, there was Beno, trotting along side keeping the files closed. He got aboard ship but could not be found and set foot on French soil with his buddies. To welcome him he found, by chance, his master and great was the reunion. The Major ruled, not without regret, that he could not transfer Beno and that once a Marine, always a Marine, so with the Corps he went to the front and lived up to all its fine traditions.

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Photographic DEPARTMENT

L. W. Brownell, Editor

With this issue of *Nature Magazine* a new department is born devoted to the interests of those members of the Association who own and use cameras. Its editor greets you and sincerely hopes that you will come to him with all your troubles along photographic lines, or with any questions which you may wish to ask. It will be his pleasure to aid you in your troubles and answer your questions to the best of his ability, so let them come. To all who are not camera enthusiasts he can only say go and buy yourself an outfit. Your enthusiasm will start to grow from the moment you first take the camera in your hands and you will soon discover that, properly used, there is more pleasure, and profit, to be derived from a camera than from almost any other form of outdoor sport.

What is the best camera for a beginner in Nature work? R. W. W.

This is a question that has been asked me many times and my answer has always been that it very largely depends upon the amount of money one wishes to spend for an outfit. For a one camera outfit there is no other that can equal one of the reflex type. With it can be made not only photographs of moving objects with exposures ranging up to 1/1000 of a second, approximately, but it can also be used on a tripod, focussing being done through the top hood or through a ground glass at the back as with an ordinary camera, and a time exposure of any desired length given. As to the size I should advise a 3¼ x 4¼. This size negative is ideal for the making of contact lantern slides and it can readily be enlarged if larger prints are desired either by direct printing or by making an enlarged negative. It is light and easily handled and is not over expensive. A medium speed lens, one working at f.6.3, is preferable to one of the faster models. The latter, when used on small objects of which as large an image as possible is desired, has not the necessary depth of field and it will often be found that while the forepart of the object is sharp and clear the rear will be out of focus unless the lens is stopped down, in which case it will have no greater speed than the slower lenses with greater depth of field. If one can afford it it is well to have two interchangeable lenses fitted to front boards in his camera. One should be of the type described, the other of the faster model, f.4.5. Thus he can use the former for all stationary or slowly moving objects, and the latter for rapidly moving objects such as flying birds where speed is the principal requisite in a lens.

Of course quite a lot of good work along Nature lines can be accomplished with a folding pocket Kodak if it is fitted with a good lens and by the use, also, of the portrait attachment, which allows of making close-ups that will give a fairly large image.

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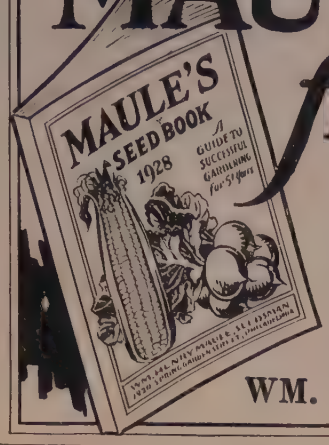

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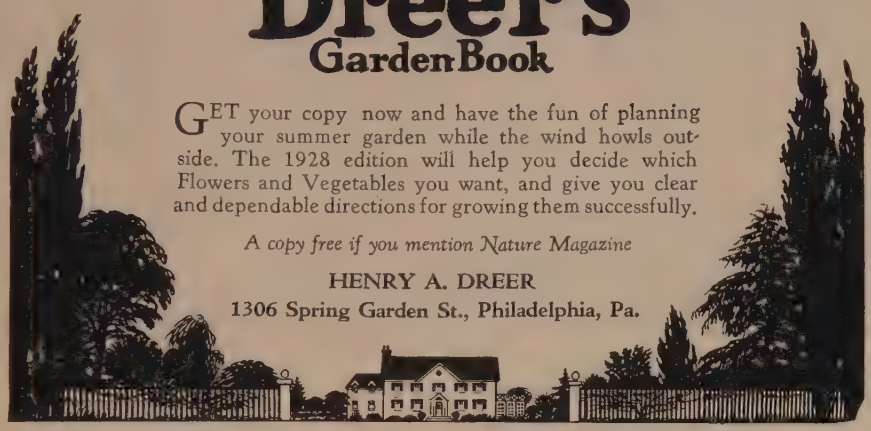

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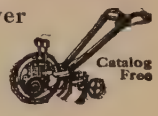

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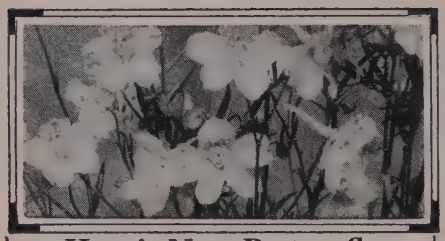

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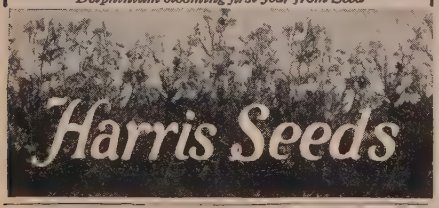

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This camera is a very desirable one for any Nature worker to have, no matter how many other cameras he may possess as it is an extremely handy little instrument to carry on trips where a larger camera would be out of the question.

Of course for those who intend to take up Nature work seriously there is no camera that can take the place of one of the long-focus tripod types. As to size it has been my experience that a 5 x 7 is better fitted to this kind of work than any other size. It is not overburdensome to carry and it is the best size for prints for reproduction.

So, it resolves itself into this, that the best outfit for a Nature worker, if he can afford it, is a good type of tripod camera, the view camera by preference, with an extension of bellows working both rear and front of at least twenty inches, fitted with one of the better type of lens, such as Zeiss, Ross or Goerz; a camera of the reflex type with two lenses that are interchangeable; and a pocket Kodak. With such an outfit there is nothing that he cannot photograph.

How are night photographs made? G. W. J.

The making of night photographs, which at one time was considered to be one of the most difficult branches of photography, has become much simplified with the advent of the new rapid lenses and the fast panchromatic plates. Where one was once in the habit of giving exposures of an hour or more, well-exposed negatives can now be made in from about three or four seconds to two or three minutes, according to the illumination. Of course, if a slower speed lens is used the length of exposure must be judged accordingly. Where there are moving lights in the picture, such as the lights on automobiles and trolleys, one must cap the lens while these are passing by and figure the exposure accordingly else there will be light streaks across the picture. The best effects are obtained on damp nights when there are good reflections, and the picture is always improved by making a short exposure just before dark and then allowing the camera to remain in place with the lens capped until the lights have appeared when the rest of the exposure can be made. Extremely effective moonlight scenes, with the moon in evidence, can be made by giving the negative a short exposure at dusk, then when the moon comes up place it in the right spot on the ground glass, put in the slide with the exposed plate, and make an exposure of about one-tenth of a second. It will help materially in placing the moon where it is desired in the picture if an outline of the skyline is drawn on the ground glass when the first exposure is made.

See Page 41 for Article on Winter Photography

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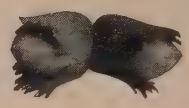

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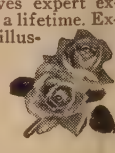

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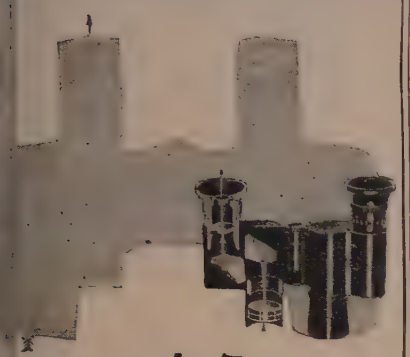

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Pacific Marine Life

The wealth of personal observation that has gone into every line and figure of the *Seashore Animals of the Pacific Coast*, by Myrtle E. Johnson and Harry J. Snook, so seldom found in other attempts of this sort, is strongly reminiscent of the fascinating studies of living animals by the keen-eyed field naturalists of several generations ago, so rare in these days of hormones, chromosomes and experimental laboratories.

The authors have accomplished a monumental task in most praiseworthy style, more than a decade of painstaking labor being represented in the six hundred odd pages of text. Having personally observed, drawn and photographed most of the animals dealt with, there is a certain freshness, life, and originality that easily renders the volume the outstanding work of its kind.

The entire work is exceedingly well balanced in its treatment of the various animal groups, both with regard to text and illustrations. There are an even seven hundred reproductions of photographs and pen and ink drawings, and furthermore eleven beautiful color plates. The latter are particularly worthy of mention as is also the lucid introduction to the why and wherefore of scientific nomenclature. The color plates are of animals which it is well nigh impossible to properly preserve, but which because of their vivid dress attract so much attention when alive, some of the coelenterates, the nemerteans and nudibranchs. Who has not wanted to know the names of at least some of these gaudy tide-pool inhabitants?

The very comprehensiveness of the field covered makes it impossible for one individual to review critically every statement in the volume, but a number of specialists in the field of invertebrate zoology agree with me that the work is exceedingly well done. It is not unnatural that a few errors of omission should occur. The west coast representative of that favorite zoological type "Amphioxus", *Branchiostoma californiense*,

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has a range greater than given, having been recorded as far northward as Laguna Beach. The sins of commission are mostly typographical, but these are trivialities that are readily caught in a second printing. The whole represents a happy correlation of University studies with the life of the animals under natural conditions. The notes on occurrence, distribution, habit and habitat are particularly valuable, as well as the frequent bibliographic footnotes and concluding list of popular works, textbooks, classified original publications and glossary.

An interesting commentary on our present knowledge, or rather lack of knowledge, of some groups of marine animals is strikingly presented. A page (page 41) of reproductions of sponges, maybe a dozen species or more and not a name for any of them! Among others, a large sea-anemone (page 103) and two sipunculids (page 176) must likewise go unnamed. Unless zoologists as a body develop a greater interest in the naming and classifying of our common marine animals, they will soon be more at a loss than ever for determinations. It is impossible today to obtain names for representatives of the groups indicated above, and others too. There is urgent need for subsidized studies on organisms such as these.

Johnson and Snook have taken a wonderful stride in the right direction; they have given just enough and in such an interesting way as to make every student and layman want to know more about these living creatures. The book is a mine of information suggestion and stimulation, and a treat for the lover of things marine. It is published by Macmillan and is listed at $7.50.

It is the best thing of its kind this country has yet produced, and should without question become one of Natural History's best sellers. W. L. S.

Animal Life

A fundamental text is the most apt description that can be given to *Science of Animal Life* by Professor William Morton Barrows of Ohio State University, just brought out by the World Book Company of Yonkers-on-the-Hudson as an addition to its New-World Science Series. This volume, profusely illustrated and simply written, is an introduction to zoology that treats of animals, their structure, development reactions to their environment and their re-

PAROQUETS

Will the party who wrote me some months ago, that he had seen and heard a few Carolina Paroquets *(C. carolinas)* somewhere in the Everglades of Florida send me his address, which unfortunately has been misplaced. Quite a number of people are interested in this matter.

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lation to man. The author moves from the premise that the study of zoology is prefatory to the study of man, the higher animal. He has so framed his book that when used with an appropriate text dealing with plant life it makes up a year's work in biology. The arrangement of his topics is logical and sequential in the light of his general plan. It is, of course, a brief text, but it serves to create the biological point of view in the mind of the student. Its list price is not at hand but details about it both as an individual volume and a text in quantity can be obtained from the publishers.

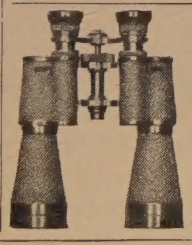
NATURE EDUCATION

(*Continued from page 56*)

Resolved that I shall identify myself with game laws in at least two ways. I shall obey the existing laws myself and shall study such national legislation as the game refuge bills that will probably be before the public; that I will not only inform myself concerning the ideals and practical principles back of these bills but that I shall see that my representatives in state and federal law-making bodies also have this information.

Resolved that at least once a month I will read some standard bit of Nature literature, that if I do not already do so, I shall by the end of the year know reasonably well the more important works of Thoreau, Mills, Muir, Burroughs, Seton, Wordsworth and their fellows.

Resolved that I shall from now on make a conscious effort to attach more than an economic, utilitarian or practical significance to my Nature experiences to the end that my appreciation of the out-of-doors may be less one-sided and more in keeping with the varied offerings which Nature has for us.



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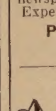

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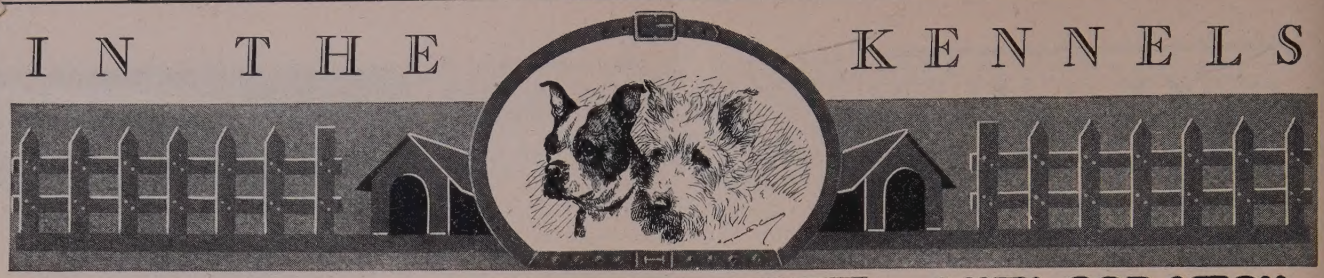

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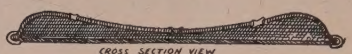
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Oklahoma Starts Tree Planting Drive

Marks Statehood Day and Sets Fine Example For Other States in Beautifying Programs

OKLAHOMA with a state tree planting day marked her anniversary of statehood. Gov. Henry S. Johnston, who, by proclamation, designated statehood anniversary as "tree-planting day," was one of the speakers at the Oklahoma City ceremony. The tree was dedicated to Mrs. John D. Sherman, president of the General Federation of Women's Clubs. Gov. Johnston has been sent a certificate of membership in the American Tree Association at Washington.

He stressed the importance of greater tree planting, not only in the cities and along highways and near public buildings, but also in the great open spaces of the state. He commended heartily the sponsorship of the tree-planting ceremonies at the Capitol by the federated women's clubs. Each statehood day, the governor said, trees should be planted as memorials to persons who had a prominent part in the affairs of the state.

Suggestions of the governor were enthusiastically approved by Mrs. George Rainey, president of state organization of federated women's clubs. A stenographic report of the governor's address was taken, and copies of it will be furnished to every women's club in the country. The purpose of this will be to show the official approval, voiced by the governor, of the interest and leading part taken by the women's clubs in furthering the tree-planting movement. Invocation was by Rev. E. C. Mobley, pastor of the First Christian Church.

"Highest Type of Tree Life" was the subject discussed by Harry B. Cordell, president of the Oklahoma Forest Commission, and a member of the Oklahoma Tree Club. He outlined his ideas of tree planting and named varieties best suited to Oklahoma soil and climate. George Phillips, secretary of the Oklahoma State Forest Commission, explained the value and importance of trees and why the state had been asked to observe a tree-planting day. "Trees as Memorials" was the subject discussed by Mrs. R. A. Billups, who represented the American Legion at the ceremony. Nothing is more ideal or suitable as a memorial than a living, growing tree, she said.

Other speakers were Mrs. Creighton Brown Burnham, president of the Towne club; Dr. Winnie M. Sanger, state director of the General Federation of Women's Clubs; Mrs. Ida Hampton, Okemah, district chairman of the Oklahoma Federated Women's Clubs; Mrs. J. A. Ross, president of the Oklahoma City Federation of Women's Clubs; Mrs. Michael Conlan, state chairman of the Indian Welfare Department; Mrs. I. L. Huff, Sapulpa, member of the State Forest Commission; Mrs. Frank Hancock of Yale. Through her and Mr. Phillips thousands of Forestry Primers of the American Tree Association have been distributed in the state.

The flag of the American Legion Post No. 35 of Oklahoma City, which has been in every meeting of the State Federation, was used with numerous other flags and decorations. All arrangements for the meeting and tree-planting ceremony were handled by Mrs. J. L. Landrum.

This plan of sending the Oklahoma idea to all state federations will give tree planting a fine incentive. In Missouri there is a plan under way now for beautifying the highways of the state by tree planting. Plans for this work should be started now for the spring program. The American Tree Association has tree planting suggestions for organizations that will be sent for a stamp for postage. The association will send "good citizenship" certificates to the tree planters registering their work with the association.

Steps to beautify the 56 miles of concrete highway between Little Rock and Hot Springs were taken in December when three units of the Arkansas Federation of Women's Clubs started planting trees and shrubbery along the route. The plan calls for uniform planting from one end of the highway to the other, with spaces between the trees filled with crepe myrtle and wild roses. Thus, it is expected, the road ultimately will wind along between walls of arching trees, with flowering vines and shrubbery hiding the fences and disguising the bare earth cuts through the hills.

The Little Rock Federation with a membership of more than 4,000 has been at work on the scheme for several months. From Little Rock to Benton, a distance of about 20 miles, the planting was done by local clubs, each unit being assigned to one mile.

Mrs. Carrol D. Wood, chairman of the Highway Committee of the Little Rock Federation, said A. M. Lund has prepared a scheme of planting for the Federation. It will include the use of all trees adapted to the soil and climate, only uniformity in size being insisted upon, with crepe myrtle, honeysuckle and wild roses for the auxiliary planting.

The largest World War Memorial Grove in the country will be completed in Philadelphia and dedicated next May, when one hundred additional oak trees will be planted in the World War Memorial Grove, near Belmont Mansion, West Fairmount Park, according to announcement made by the committee in charge. The announcement came at the planting of the 200th tree on Armistice Day. The committee was organized in May, 1925, and during May of the following year four acres were purchased, 170 trees planted and the grove dedicated to the memory of the great sacrifice of Pennsylvania men and women who died in the service of the United States and the Allied Armies of the World War. If the present plans are carried out the entire grove of 300 trees will be completed by May, 1928. This will be the largest Memorial Grove in the country, according to the committee. At the present time, the largest grove is the Masonic Memorial Grove planted at Elizabethtown.

Thirty-three DeMolay groups of the state of Washington, in cooperation with the United States Forest Service have completed the planting of 50,000 trees in a devastated district of the Wind River valley. More than 200 acres of land have been planted to new trees. The DeMolays purchased Douglas fir trees for the site and the planting was done by the Forest Service under the direction of F. V. Horton, supervisor of the Columbia National Forest.

There is great inspiration in these reports. Springtime is not far away. The tree planting army waits only on weather. There is nothing like organization well in advance to carry out a program of any magnitude. The time to plan is now and then report your action to the American Tree Association.

BLACK STUMPS

by J. C. Livingston

Black Stumps—that once were living trees,
Redwood, and Fir, and Pine,
Luring the vagrant woodland breeze,
Guarding the Forest Shrine,
Tossed by the storms of centuries,
Last of an ancient line.

Black Stumps—a sombre epigraph
O'er the woodlands' awful tomb;
Left in the wake of satanic wrath,
Ghastly and gaunt they loom
Stark and dead in the ravaged path,
Smoke scarred pillars of doom.

Black Stumps—gruesome, ugly, and drear,
Wrought by a careless hand;
Guarding the forest's lonely bier,
Mourning the wasted land;
Spreading to forests far and near,—
Black Stumps—grim warnings stand.

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